SONY

DIGITAL VIDEOCASSETTE RECORDER

DVW-250/250P

Digital BETACAM™

MAINTENANCE MANUAL Part 1

1st Edition

Serial No. 10001 and Higher

⚠ 警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理など行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠ WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

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Manual Structure

Purpose of this manual

This manual is the maintenance manual of Digital Videocassette Recorder DVW-250/250P.
This manual describes the maintenance information of this unit, and the information on primary services such as the replacement of main blocks and circuit boards.

Contents

The following is a summary of the sections for understanding the contents of this manual.

Section 1 Service Overview
Explains the locations of main part, the functions of printed circuit board, the removal and installation of cabinet, and the measures against trouble.

Section 2 Error Message
Explains the error messages.

Section 3 Maintenance Mode
Explains the maintenance mode of this unit.

Section 4 Overall Block Diagrams and Circuit Descriptions
Describes the overall block diagrams and the circuit descriptions.

Section 5 Periodic Maintenance and Inspection
Explains the cleaning procedures and periodic checks.

Section 6 Replacement of Mechanical Parts
Explains how to replace the parts that should replace periodically and how to adjust them after the replacement.

Section 7 Tape Path Alignment
Explains the adjustment procedures of tape path system.

Section 8 Replacement of Circuit Boards
Explains how to replace the main boards.

Section 9 Electrical Alignment
Explains the general information for electrical adjustments and the electrical adjustments of this unit.

Section 10 Spare Parts
Describes the exploded views for the unit and mounted/printed circuit boards list.

Relative manual

Besides this "Maintenance Manual 1", the following manuals are available for this unit.

- **Operation Manual (Supplied with this unit.)**
  This manual is necessary for application and operation of this unit.

- **Maintenance Manual Part 2 (Not supplied with this unit.)**
  This manual describes the information items (adjustments, board layouts, schematic diageams, detailed parts list, etc.) that premise the service based on parts. If this manual is required, please contact to Sony's service organization.

Section 1
Service Overview

1-1. Operating Conditions

Operating temperature : 0 to 40°C
Humidity : 25 to 85% (Relative humidity)
Storage temperature : –20 to +60°C
Use under special environment (Measure for cold area)

The unit is guaranteed its operation under the temperature of 0 °C to 40 °C. When the unit is used under 0 °C, cover-cloth against the cold is recommended to use.

CAUTION

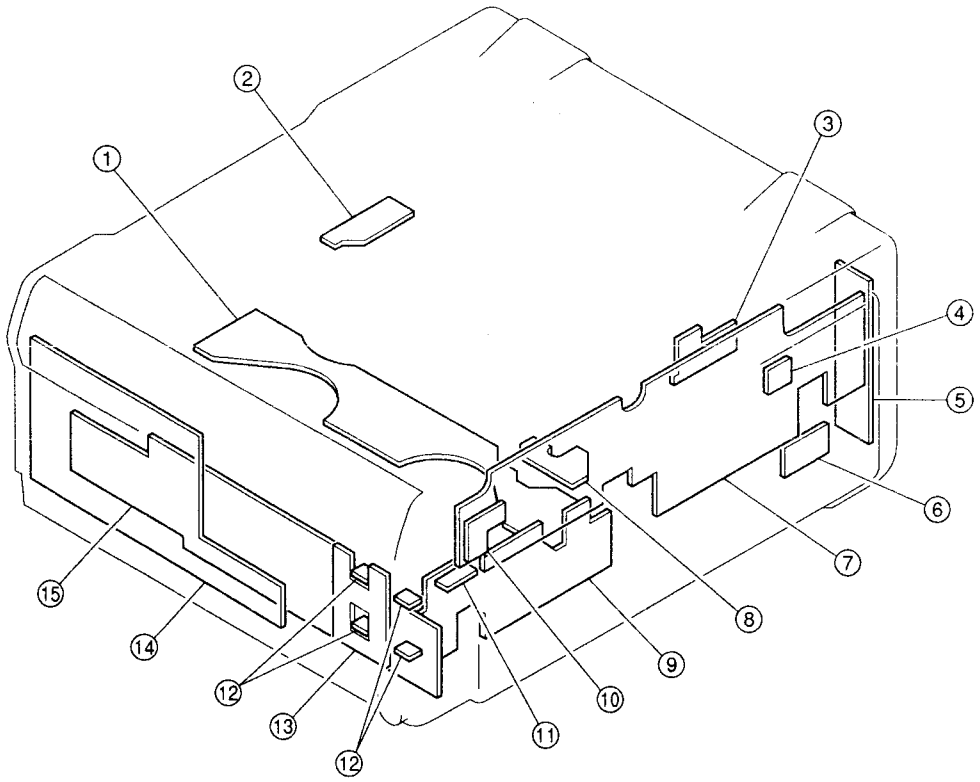
In the following environments, if the unit is operated continuously in the carrying case it may become hot.
In such cases avoid removing the unit from the carrying case, as this may result in burns or injury.
If necessary, attach the shoulder strap.

- In direct sunlight
- In a car on a hot sunny day
- Near heating appliances

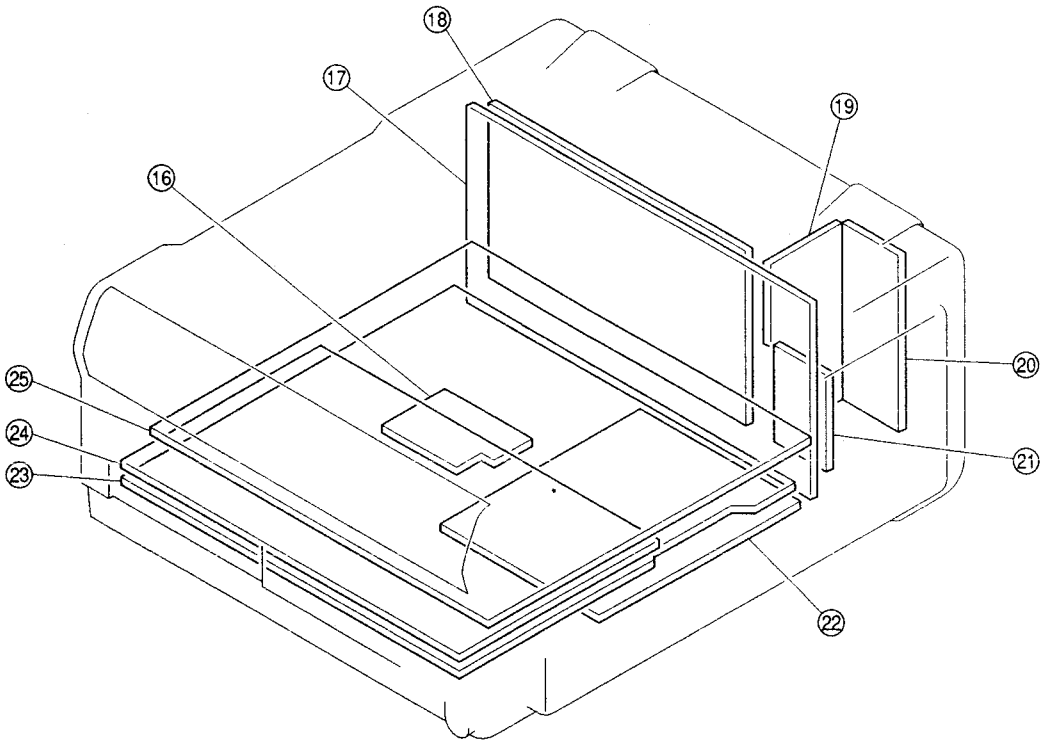
Power voltage DC12 $^{+5.0}_{-1.0}$ V
Power consumption During recording : 39 W(CONFI ON, SDI OUT ON)
28 W(CONFI OFF, SDI OUT OFF)
During STOP mode : 3 W(SAVE mode)

1-2. Locations of Main Part and Functions of Printed Circuit Board

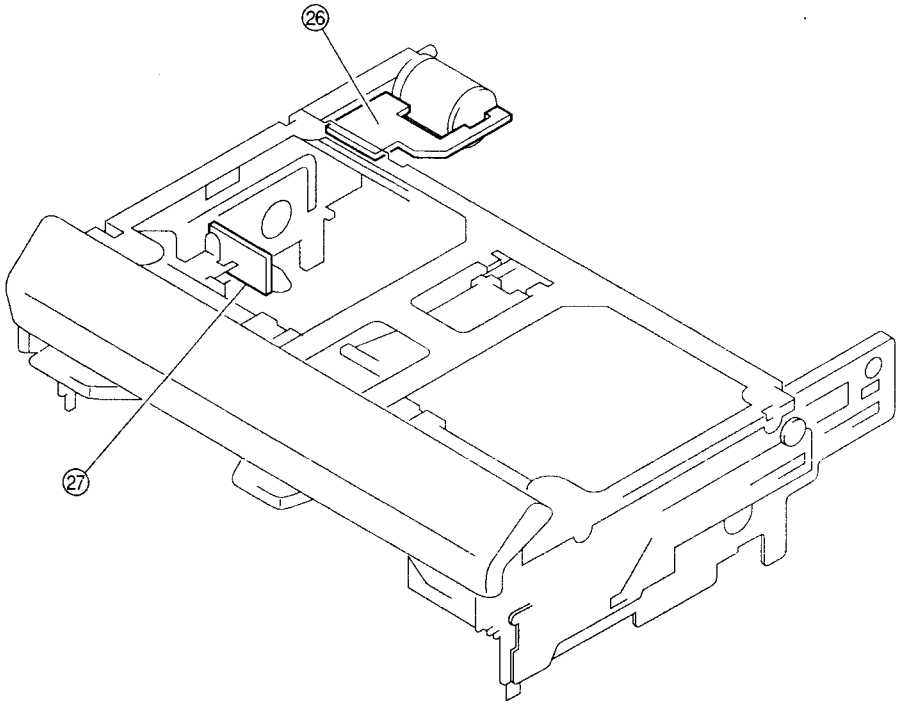
1-2-1. Functions of Printed Circuit Board and Printed Circuit Board Location



System	Board name	Circuit function	Location No.
VIDEO	CC-66	Video Input/Output	9
AUDIO	CP-260	Audio Input/Output, Panel Switches	7
	ADA-44	Audio Signal Processor (AD/DA)	15
	VR-194	Audio Rec Level Selector (Preset/Variable)	13
	VR-206	Audio Rec Level Control	12
	VR-205	Phone Level Control	11
	DUS-339	Head Phone Connector	10
SERVO, SYSTEM CONTROL, TIMECODE	KY-315	Panel Switches	14
	CON-18	TC IN/OUT Connectors	6
	SE-233	Sensor (Casette Coding)	1
	DET-26	Sensor (Thread/Unthread)	8
	DET-15	Cassette In Detector	3
	TR-57	S-Tension Detector	2
POWER SUPPLY	DC-85	DC Input Select Switch	4
	FU-63	Fuse	5



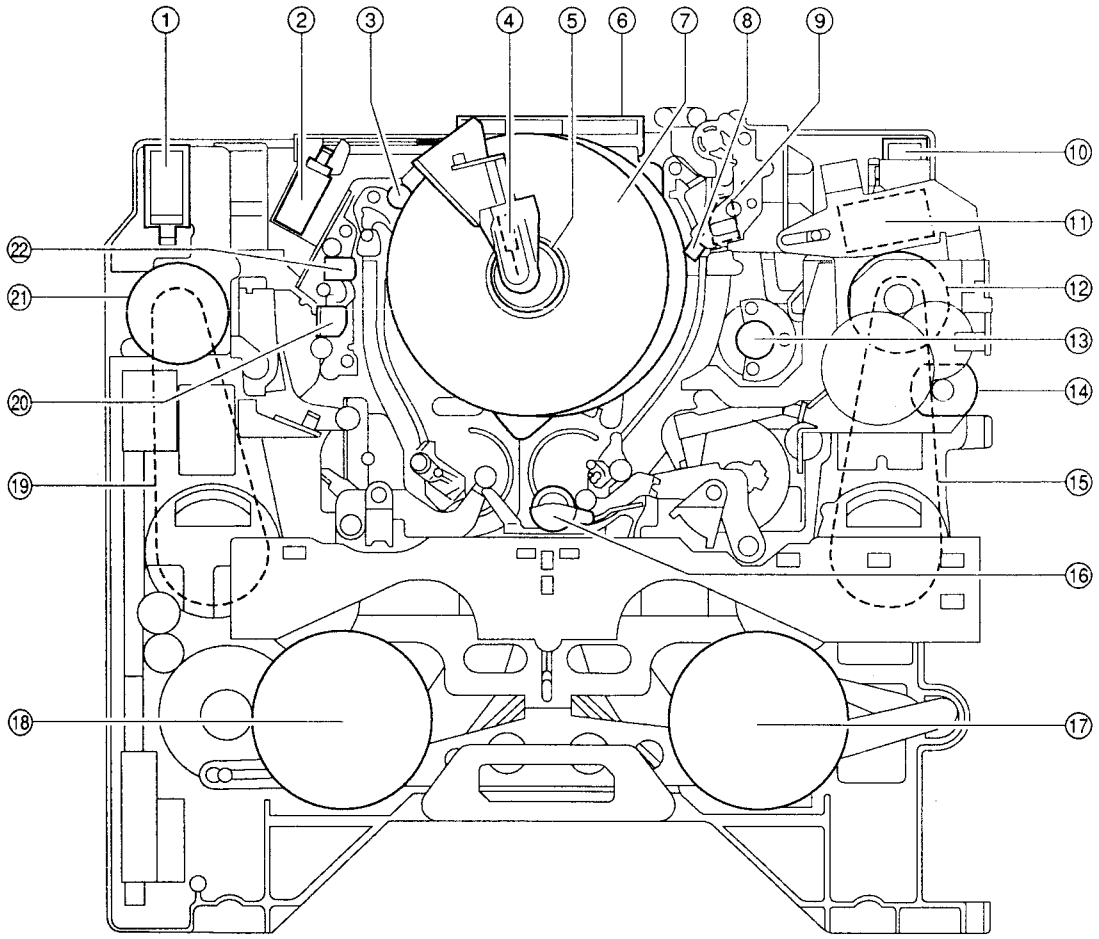
System	Board name	Circuit function	Location No.
VIDEO	VPR-12	Video Signal Processor (AD/DA)	24
AUDIO	APR-20	Audio Signal Processor (Limiter)	16
DIGITAL PROCESS	DPR-62	Digital Data Processor (Encode/Decode, Error Correction) Ref CK Generator, Data Rate Converter Rec Current Control, Rec Envelope Detector	23
	DIF-31	4:2:2 Component Serial Digital Interface	22
RF & CUE	EQ-54	RF Equalizer (PB EQ, PB Envelope Detector) Cue Rec/PB	18
SERVO, SYSTEM CONTROL, TIMECODE	SST-3	Servo & System Control, Timecode Full Erase & Channel Erase Oscillator	25
POWER SUPPLY	PSW-31A	DC-DC Converter	19
	PSW-31B	DC-DC Converter	20
	PSW-31C	DC-DC Converter	21
OTHERS	MB-601	Mother Board	17



System	Board name	Circuit function	Loction No.
SERVO, SYSTEM CONTROL, TIMECODE	CS-25	Cassette Up/Down Detector	27
	CS-26	Cassette Up/Down Detector	26

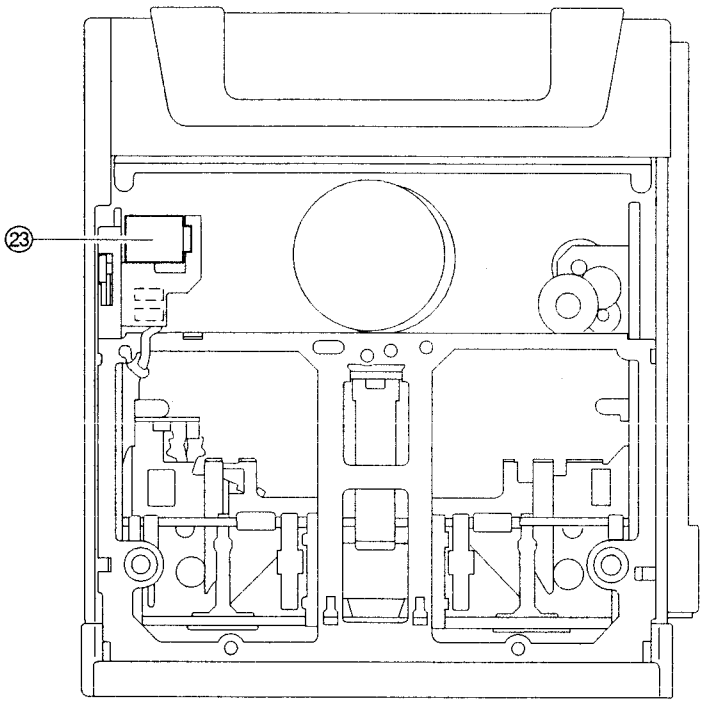
1-2-2. Main Mechanical Part Locations

Mechanical deck



1: Solenoid (S reel brake)
2: Solenoid (Head cleaner)
3: Video head cleaning roller
4: Brush
5: Slip ring
6: Drum
7: Upper drum
8: CUE brush
9: CUE/TC head
10: Solenoid (T reel brake)
11: Solenoid (Pinch)
12: T reel motor
13: Capstan motor
14: Threading motor
15: T reel belt
16: Pinch roller arm
17: T reel table
18: S reel table
19: S reel belt
20: FE head
21: S reel motor
22: CTL head

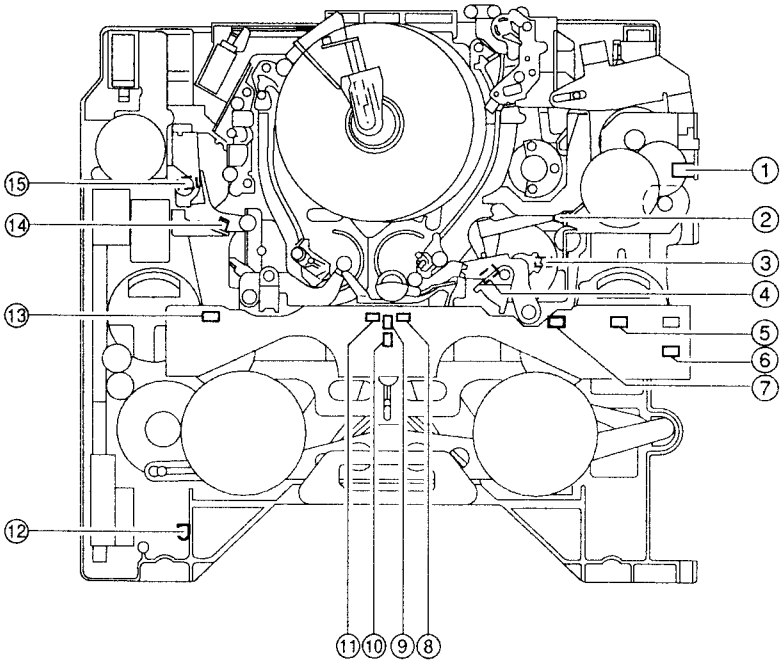
Cassette compartment



23: DC motor

1-2-3. Function and Location of Sensors

Mechanical deck



1: Threading FG sensor

The threading FG sensor detects the rotation speed of the threading motor.
The FG output signal of this detection sensor is input to the servo circuit to control the threading speed so that the tape is not damaged during threading and unthreading.

2: Tape top sensor

This sensor detect the top of the tape, and in addition detects the tape end of the tape that runs in the reverse direction.

3: Threading-end sensor

4: Unthreading-end sensor

These sensors detects whether S/T drawer guides and S/T sliders reach the threading-end or unthreading-end position by rotation angle of the gear.

5: L casette sensor

This sensor detects whether the inserted cassette tape is an L size.

6: L cassette REC inhibit sensor

This is a REC inhibit plug detector switch for the digital large cassette.

7: Cleaning tape detect sensor

Using a tub on the back side of the cassette tape, this sensor detects whether a cleaning tape is being inserted into the unit.

8: Tape thickness sensor

Using a tub on the back side of the cassette tape, this sensor detects the thickness of the tape wound on a cassette tape that is being inserted into the unit.

9: Metal/oxide tape sensor

Using a tub on the back side of the cassette tape, this sensor detects whether an oxide tape or metal tape is being inserted into the unit. (Only during analog tape playback)

10: Analog/digital tape sensor

Using a tub on the back side of the cassette tape, this sensor detects whether an analog tape or digital tape is being inserted into the unit.

11: Reel hub diameter sensor

The reel hub diameter of a cassette tape varies depending on the length of the tape wound on the cassette tape. The reel hub diameter sensor detects the reel hub diameter using a tub on the back side of the cassette tape. The output signal of this sensor is input to the servo circuit to control the rotation speed and torque of the reel motor.

12: Condensation sensor

This sensor detects whether the dew condensation occurs in the unit.

13: S cassette REC inhibit sensor

This is a REC inhibit plug detection switch for the digital small cassette.

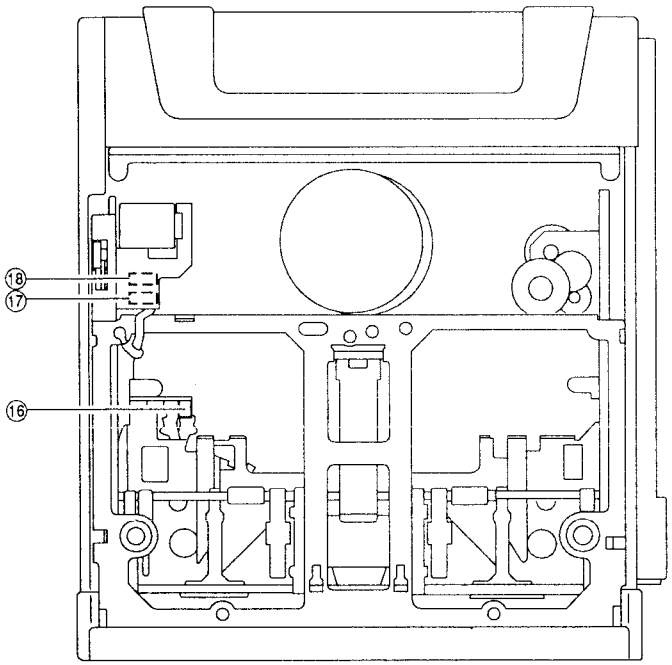
14: Tape end sensor

This sensor detects the end of the tape that runs in the forward direction.

15: S tension regulator arm sensor

During recording and playback, this sensor detects the tension arm position and controls the reel torque to keep a constant S tape tension.

Cassette compartment



16: Cassette-in sensor
This sensor detects whether a cassette is being inserted.

17: Cassette-up sensor

18: Cassette-down sensor
The cassette-down sensor detects the movement of the cassette compartment through combined ON/OFF operation of the cassette-down sensor, cassette-up sensor, and cassette-in sensor.

1-3. Matching Connectors

When external cables are connected to the connector on the connector panel during maintenance, the hardware listed below (or the equivalents) must be used.

Panel indication	Matching cable connector/cable	
	Connector	Sony part No.
VIDEO IN SDI IN, SDI OUT VIDEO OUT 1, VIDEO OUT 2 TC IN, TC OUT	BNC	1-560-069-11
AUDIO IN CH-1 to CH-4	XLR 3P,MALE	1-508-084-00
AUDIO OUT CH-1 to CH-4	XLR 3P,FEMALE	1-508-083-00
DC IN 12V	XLR 4P,FEMALE	1-508-362-00
DC OUT	ROUND TYPE 4P,MALE	1-566-425-11
CAMERA	26P,MALE(ROUND TYPE)	1-564-183-00
RFU OUT VIDEO DC AUDIO	RFU ADAPTOR AV CABLE	
REMOTE	D-SUB 9P,MALE JUNCTION SHELL	1-560-651-00 1-561-749-00

1-4. Signal Input/Output

INPUT

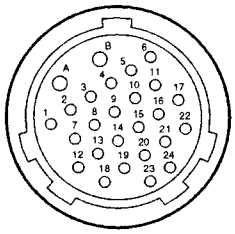
SDI IN	D1 format serial digital (Video, Audio 4 ch) SMPTE 259M/ITU-R BT.656
VIDEO IN	Analog composite : 1.0 V p-p,75 Ω
CAMERA	D1 format serial digital (Video, Audio 4 ch) SMPTE 259M/ITU-R BT.656 Analog component : 1.0 V p-p,75 Ω (Y) 0.7 V p-p,75 Ω (R-Y,B-Y) Analog audio : Selectable between –60,-20 and +4 dBu Impedance 10 Ω or more, balanced
AUDIO IN CH-1 to CH-4	Selectable between –60, –20 and +4 dBu Impedance 10 kΩ or more, balanced
TC IN	0.5 to 18 V p-p, impedance 10 kΩ or more, unbalanced
DC IN 12 V	11 to 17 V

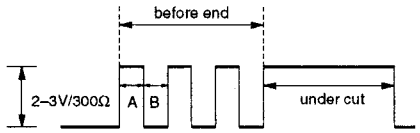
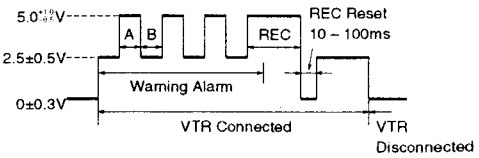
OUTPUT

SDI OUT	D1 format serial digital (Video, Audio 4 ch) SMPTE 259M/ITU-R BT.656
VIDEO OUT	Analog composite : 1.0 V p-p,75 Ω Selectable text superimposition on output 2 only
AUDIO OUT CH-1 to CH-4	+4 dBm (600 Ω load), balanced
TC OUT	2.2 V p-p (600 Ω load), unbalanced 1.2 V p-p (75 Ω load), unbalanced
EARPHONE	–17 dBu maximum (8 Ω load), adjustable
HEAD PHONES	–17 dBu maximum (8 Ω load), adjustable

CAMERA:26-pin (female)

<External view>



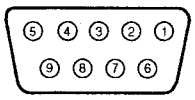
Pin No.	Signal	Signal direction CAMERA VTR	Specification
A	DC +12 V	←	Unregulated +12 V DC Power Supply
B	GND	—	DC Power Return
1	CAM SDI *1	→	Zi = 75 Ω ± 5 %
2	GND (CAM SDI) *1		
3	GND (LUMINANCE)	→	Zi = 75 Ω ± 5 %
4	LUMINANCE		
5	R-Y VIDEO	→	Zi = 75 Ω ± 5 %
6	GND (R-Y)		
7	B-Y VIDEO	→	Zi = 75 Ω ± 5 %
8	GND (B-Y)		
9	MIC (X)	→	Zi = 3 k to 10 kΩ
10	MIC (Y)		
11	GND (MIC)		BALANCED
12	VTR START/STOP	→	START: 5 $^{+3}_{-1}$ V; STOP: 0 $^{+0.5}_{-1}$ V or open
13	BATT. IND	←	 14.5 V Max open, 2-3 V with 300 Ω load A/B:50 ± 10 % duty, frequency 1 ± 0.2 Hz or 4 ± 0.8 Hz.
14	COMPOSITE/SDI	→	Composite:+5 V, SDI:GND
15	REC/TALLY	←	 A/B:50 ± 10 % duty, frequency 1 ± 0.2 Hz or 4 ± 0.8 Hz
16	(SPARE)	→	
17	SHIELD	—	VTR GND
18	CAM RETURN VIDEO	←	VS = 1 V p-p ± 1 dB
19	GND (CAM RETURN VIDEO)		DC:0 ±200 mV Zo = 75 Ω ± 5 %

Pin No.	Signal	Signal direction CAMERA VTR	Specification
20	VTR SAVE	◄——►	AUDIO MONITOR Zo:Low impedance Level:-6 dBs VTR SAVE Ri ≥ 100 kΩ (Ri:input DC resistance)
21	SDI AUDIO LEVEL	——►	(To be fixed)
22	(SPARE)	——	
23	(SPARE)	◄►	
24	(SPARE)	◄►	

*1)When analog component camera, analog composite.

REMOTE:9-pin (female)

<External view>



Selectable between SONY 9pin protocol and ISR using the setup menu.
(How to change refer to "3-1. Setup Menu".)

SONY 9-pin protocol

Pin No.	Signal
1	Frame Ground
2	Receive A
3	Transmit B
4	Transmit Common
5	Spare
6	Receive Common
7	Receive B
8	Transmit A
9	Frame Ground

ISR

Pin No.	Signal
1	CD;Carrier Detect
2	RXD;Received Data
3	TXD;Transmitted Data
4	DTR;Data Terminal Ready
5	GND;Signal Ground
6	DSR;Data Set Ready
7	RTS;Request to Send
8	CTS;Clear to Send
9	CI;Calling Indicator

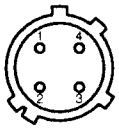
DC IN:XLR, 4-pin (male)

<External view>

Pin No.	Signal
1	GND
2	–
3	–
4	UNREG +12 V

DC OUT 12 V:DIN, 4-pin (female)

<External view>



Pin No.	Signal
1	UNREG GND
2	–
3	–
4	UNREG +12 V

1-5. Removal/Installation of Cabinet

CAUTION

Be sure to turn the power off, and remove the power cord and/or battery.

Battery Case

1. Remove the top panel and bottom plate.
2. Disconnect the connector CN915 and fasten terminal CN932 on the MB-601 board.
   (CN932 disconnection : Pinch the terminal and pulled out.)
3. Remove the four screws and pull out the battery case.
4. Disconnect the fasten terminal from the connector CN422 on the FU-64 board.
5. Remove the battery case from the unit.

Top Panel

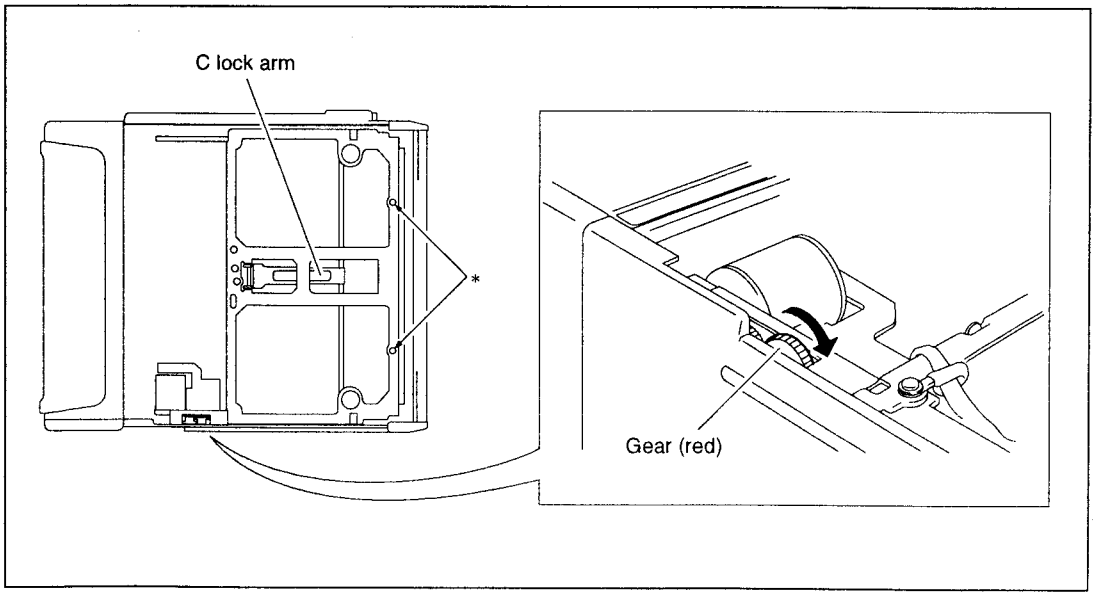
Loosen the four coin screws and move the top panel in the direction of the arrow.

Front Cover

Loosen the two screws and remove the front cover from the unit.

Front Panel

1. Remove the front cover.
2. While lifting up the C lock arm of the cassette compartment, turn the gear (red) in the direction of the arrow to slide the cassette compartment 10 to 20 mm. Remove the two screws and the two washers through the holes (* mark) as shown in the figure.
   Note At this time, the two washer are out from the front panel, do not lose them.



3. Remove the three screws from the front panel.
4. Remove the four volume knobs and remove the front panel from the unit.
   At this time, the switch covers are out from the front panel, do not lose them.

Notes during installation

After attaching the front panel, check the switch covers are attached with it.

Handle

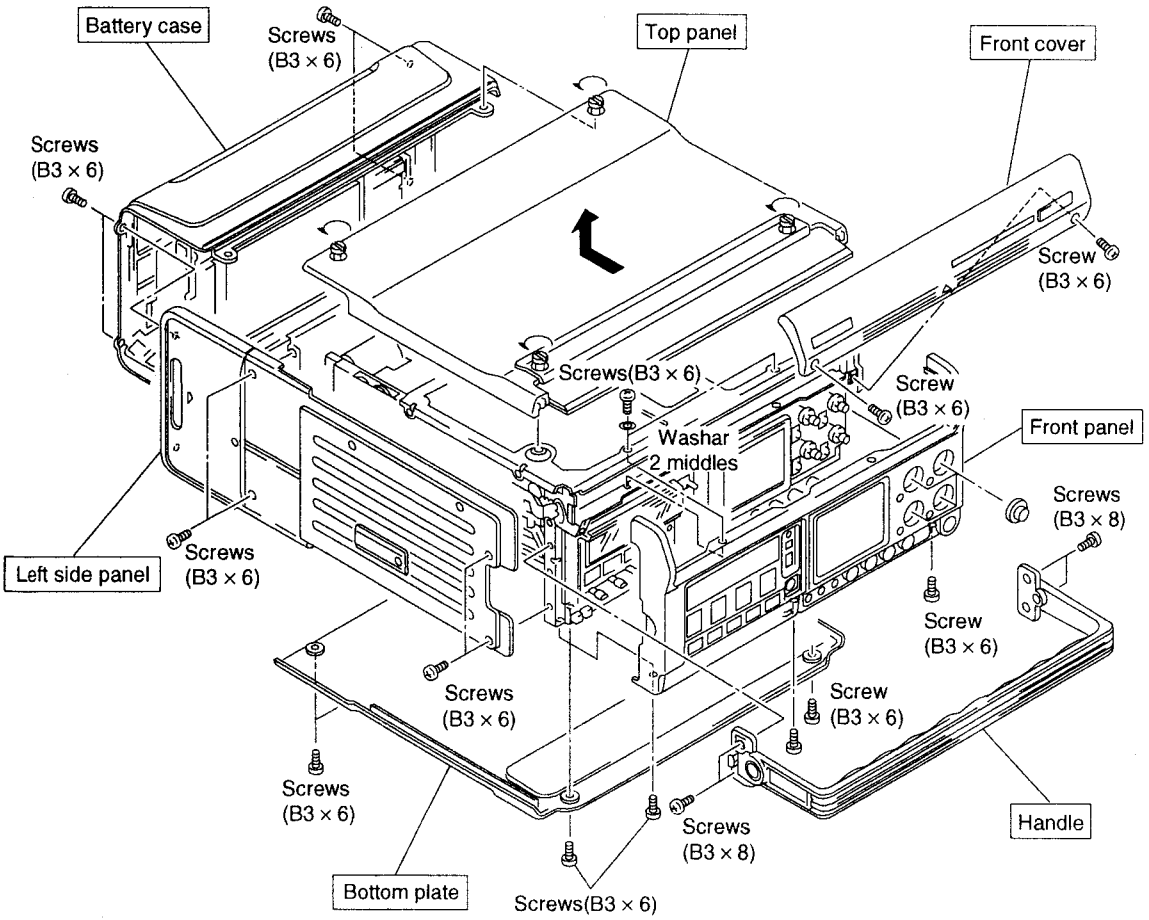
1. Remove the front panel.
2. Loosen the four screws and remove the handle from the unit.

Bottom Plate

Loosen the four screws and remove the bottom plate from the unit.

Left Side Panel

1. Remove the top panel, bottom plate, handle, front panel and battery case.
2. Remove the cassette compartment. (Refer to Section 1-6.)
3. Remove the four screws and remove the left side panel from the unit.



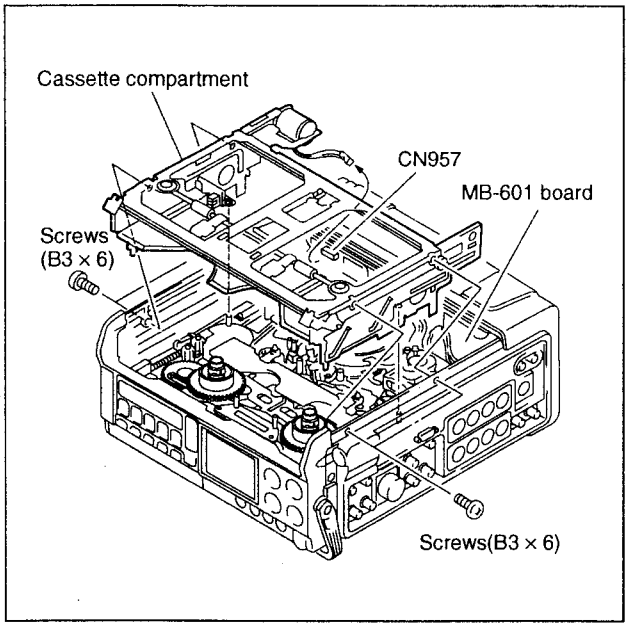
1-6. Cassette Compartment Removal/ Installation

CAUTION

Be sure to turn the power off, and remove the power cord and/or battery.

Removal

1. Put the unit into the intermediate position of the reel tables. (Refer to Section 6-1-5.)
2. Remove the four screws on the side of the unit.
3. Disconnect the connector CN957 from the MB-601 board.
4. Remove the cassette compartment from the unit.



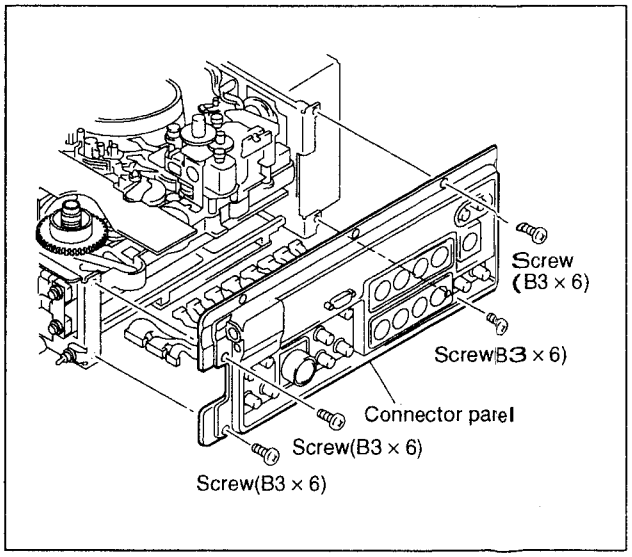
Notes During Installation

- When install the cassette compartment, be careful not to put the harness between the connector panel and front panel.
- Attach the cassette compartment in the chassis so that the two guide pins of the cassette compartment are put into the round holes of stage.

1-7. Connector Panel Removal/ Installation

Removal

1. Remove the top plate, handle, bottom plate, battery case and cassette compartment. (Refer to "1-5. Removal/Installation of Cabinet" and "1-6. Cassette Compartment Removal/Installation".)
2. Disconnect the connectors CN551, CN552 and CN553 on the ADA-44 board. And then remove the clamper.
3. Open the video boards assembly. (Refer to Section 8-2-1.)
4. Disconnect the connectors CN101, CN105, CN106, CN108 through CN110, CN112 and CN113 on the SST-3 board.
5. Disconnect the connectors CN921, CN923 and CN930 on the MB-601 board. And then disconnect the connectors CN601 and CN912 on the DC/DC converter.
6. Remove the four screws and remove the connector panel from the unit.

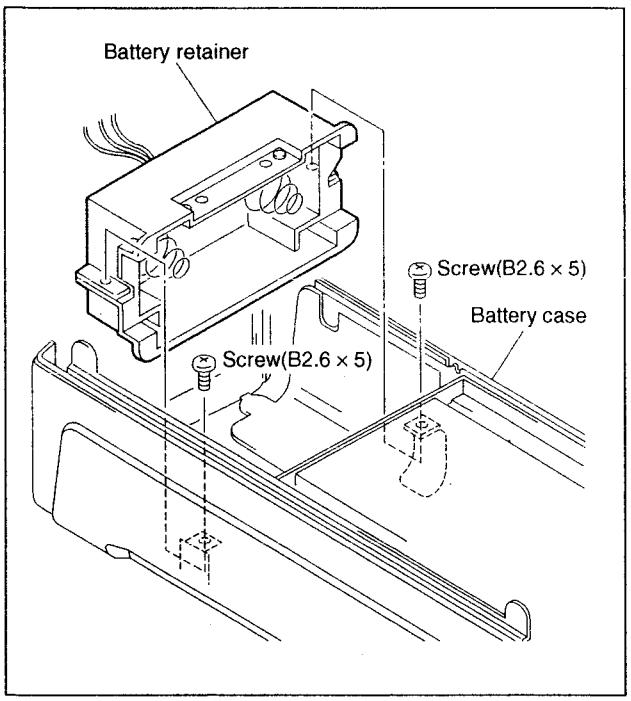


Note During Installation

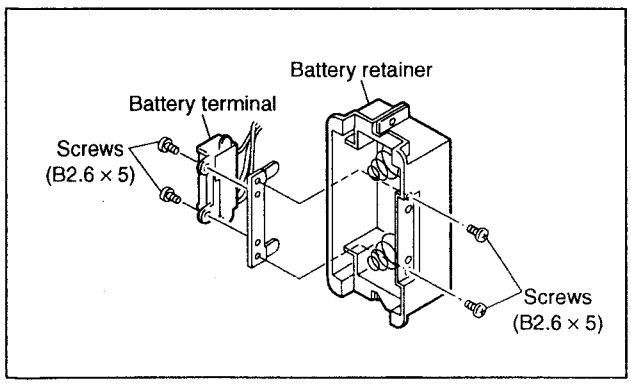
After install the connector panel, perform the tape path adjustment. (Refer to Section 7-2.)

1-8. Battery Terminal Replacement

1. Remove the battery case. (Refer to "1-5. Removal/ Installation of Cabinet".)
2. Remove the two screws and remove the battery retainer.



3. Remove the four screws and then replace the battery terminal.



1-9. Fuse Replacement

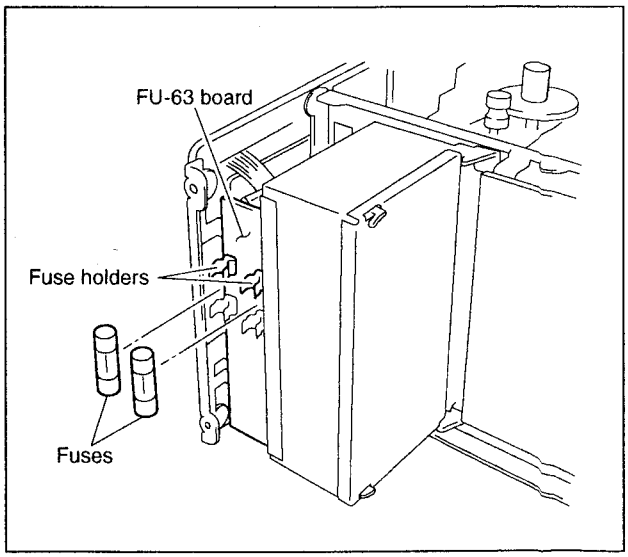
Fuse is mounted on FU-63 board. If a trouble occurs on the unit and when overcurrent flows, the fuse will blow. Fuse should be replaced with the following parts after removing a foreign matter that occurs short.

CAUTION

The fuse should be replaced after the power switch is turned off and the power code is disconnected. Be careful replacing the capacitor in the switching regulator because it may be charged.

Part No.	Name
⚠1-532-749-11	Fuse, Glass Tube 8 A 125 V

1. Remove the battery case. (Refer to "1-5. Removal/ Installation of Cabinet".)
2. Remove the defective fuse from the fuse holder and replace it with a new one.

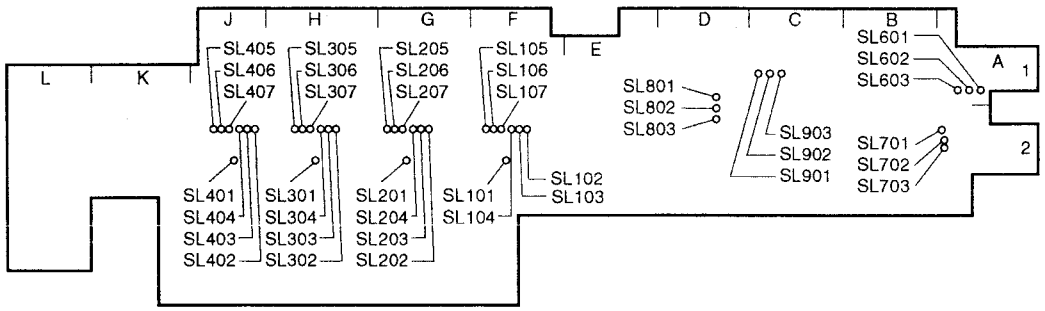


1-10. Switch/Slit Land Settings on the Boards

Note

Never change the settings of the factory use switches.

1-10-1. CP-260 board



CP-260 B SIDE

Audio input level selection [When the audio input level switch (–60/–20/+4 dB) on the connector panel is set to "-60".] (Selectable of –60 dBu or –40 dBu using slit lands. Factory setting : –60 dBu)

Audio Channel	Ref No.	Input level (dBm/600 Ω)	
		-60	-40
CH-1	SL101	SHORT	OPEN
CH-2	SL201	SHORT	OPEN
CH-3	SL301	SHORT	OPEN
CH-4	SL401	SHORT	OPEN

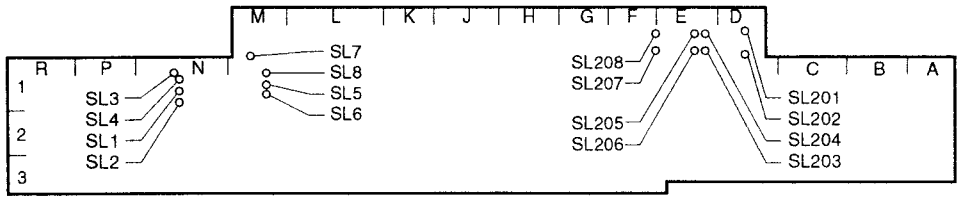
Audio input level selection [When the audio input level switch (–60/–20/+4 dB) on the connector panel is set to "+4".] (Selectable of +4 dBu, 0 dBu or –3 dBu using slit lands. Factory setting : +4 dBu)

Audio Channel	Ref No.	Input level (dBm/600 Ω)		
		4	0	-3
CH-1	SL102 SL105	OPEN	OPEN	SHORT
	SL103 SL106	OPEN	SHORT	OPEN
	SL104 SL107	SHORT	OPEN	OPEN
CH-2	SL202 SL205	OPEN	OPEN	SHORT
	SL203 SL206	OPEN	SHORT	OPEN
	SL204 SL207	SHORT	OPEN	OPEN
CH-3	SL302 SL305	OPEN	OPEN	SHORT
	SL303 SL306	OPEN	SHORT	OPEN
	SL304 SL307	SHORT	OPEN	OPEN
CH-4	SL402 SL405	OPEN	OPEN	SHORT
	SL403 SL406	OPEN	SHORT	OPEN
	SL404 SL407	SHORT	OPEN	OPEN

Audio output level selection
(Selectable of +4 dBm, 0 dBm or –3 dBm using slit lands. Factory setting : +4 dBm)

Audio Channel	Ref No.	Output level (dBm/600 Ω)		
		4	0	-3
CH-1	SL601	SHORT	OPEN	OPEN
	SL602	OPEN	SHORT	OPEN
	SL603	OPEN	OPEN	SHORT
CH-2	SL701	SHORT	OPEN	OPEN
	SL702	OPEN	SHORT	OPEN
	SL703	OPEN	OPEN	SHORT
CH-3	SL801	SHORT	OPEN	OPEN
	SL802	OPEN	SHORT	OPEN
	SL803	OPEN	OPEN	SHORT
CH-4	SL901	SHORT	OPEN	OPEN
	SL902	OPEN	SHORT	OPEN
	SL903	OPEN	OPEN	SHORT

1-10-2. ADA-44 board

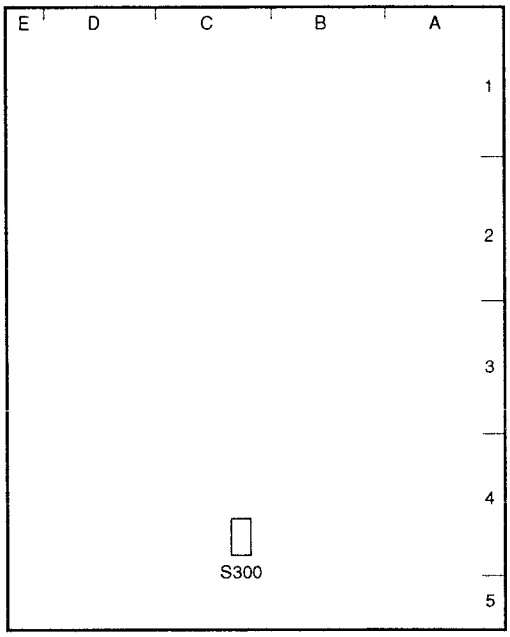


ADA-44 B SIDE

Headroom level select (Factory setting : 20 dB)

	Ref No.	Headroom (dB)		
		20	18	16
REC CH-1	SL1	OPEN	SHORT	OPEN
	SL2	OPEN	OPEN	SHORT
REC CH-2	SL3	OPEN	SHORT	OPEN
	SL4	OPEN	OPEN	SHORT
REC CH-3	SL5	OPEN	SHORT	OPEN
	SL6	OPEN	OPEN	SHORT
REC CH-4	SL7	OPEN	SHORT	OPEN
	SL8	OPEN	OPEN	SHORT
PB CH-1	SL201	OPEN	SHORT	OPEN
	SL202	OPEN	OPEN	SHORT
PB CH-2	SL203	OPEN	SHORT	OPEN
	SL204	OPEN	OPEN	SHORT
PB CH-3	SL205	OPEN	SHORT	OPEN
	SL206	OPEN	OPEN	SHORT
PB CH-4	SL207	OPEN	SHORT	OPEN
	SL208	OPEN	OPEN	SHORT

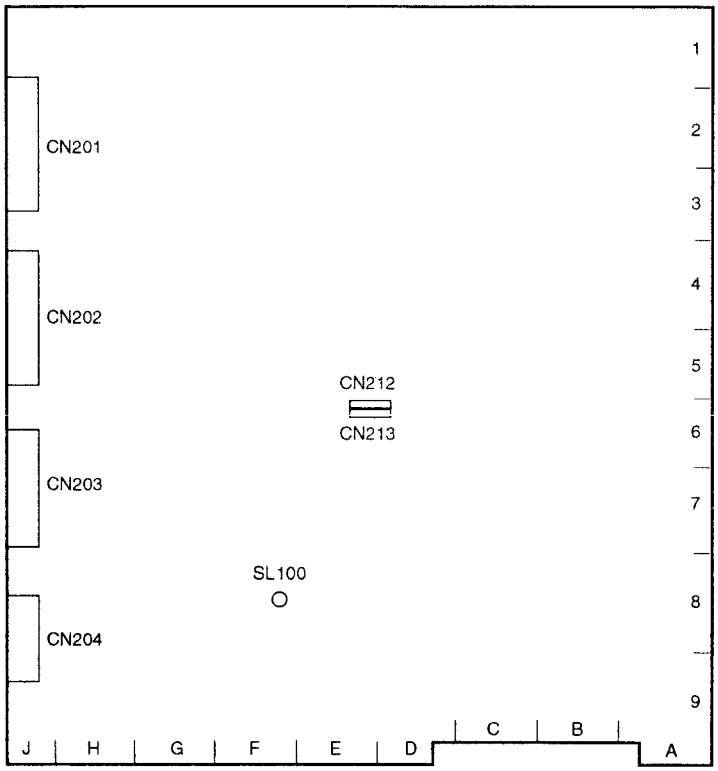
1-10-3. DIF-31 board



DIF-31 B SIDE

Ref No.	Name	Description	Factory setting
S300-1	ENCODER-VCO adjustment switch	ON : VCO adjustment OFF : Normal use	OFF
S300-2	DECODER-VCO adjustment switch	ON : VCO adjustment OFF : Normal use	OFF

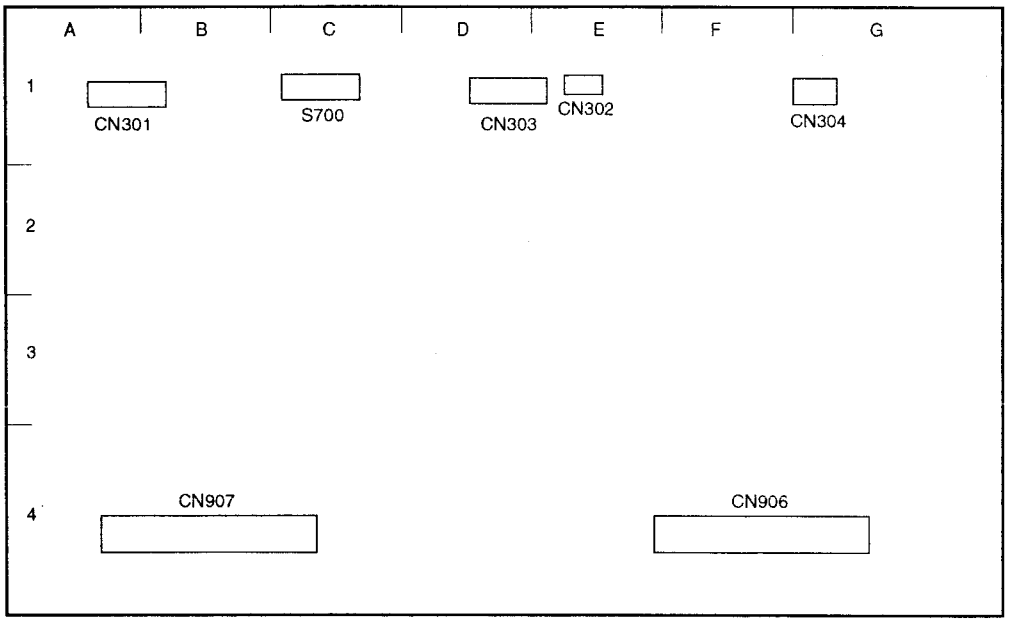
1-10-4. DPR-62 board



DPR-62 B SIDE

Ref No.	Description	Factory setting
SL100	Factory use	OPEN

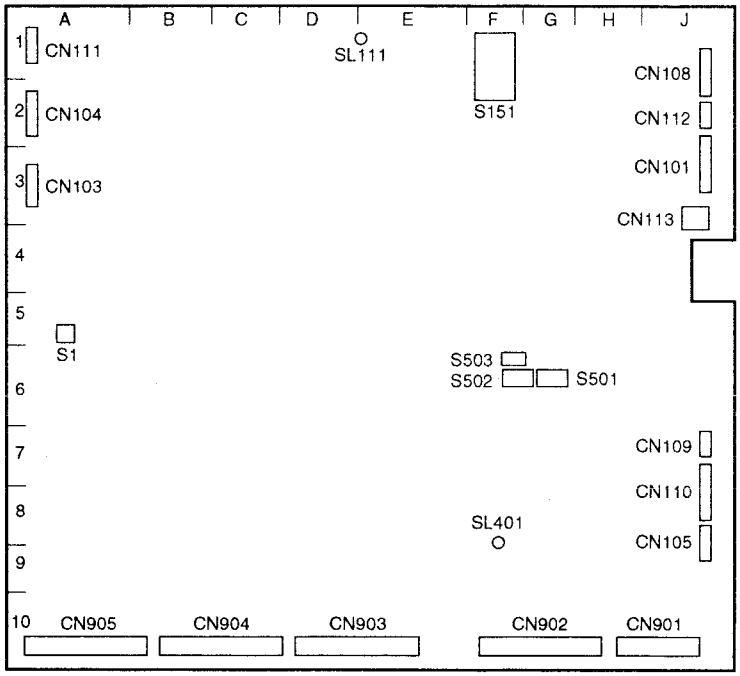
1-10-5. EQ-54 board



EQ-54 A SIDE

Ref. No.	Name	Description	Factory setting
S700-1	REC/PB ENV switch	Using at tape path adjustment. ON : R/P envelope detect mode (Turn the power off in the EQ-54 board and drum) OFF : Normal use	OFF
S700-2	–	Factory use	OFF
S700-3	–	Factory use	OFF
S700-4	–	Factory use	OFF

1-10-6. SST-3 board

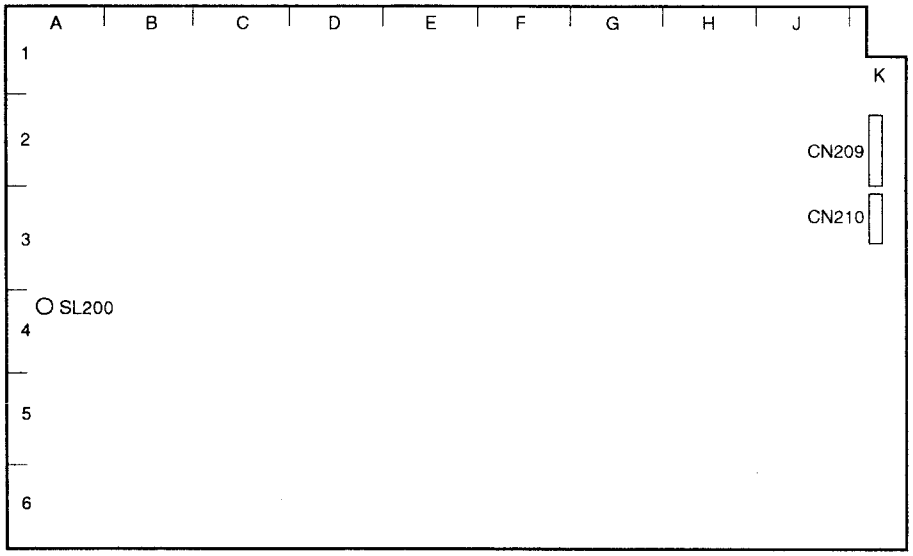


SST-3 A SIDE

Ref No.	Name	Description	Factory setting
S1	RESET switch	Reset the CPU for system control	–
S151	–	Factory use	1 to 4, 6, 7 : OFF 5, 8 : ON
S501	–	Factory use	–
S502	–	Factory use	–
S503	–	Factory use	OFF

Ref No.	Description	Factory setting
SL111	OPEN : Use no back up battery SHORT : Use the back up battery	SHORT
SL401	ROM selection OPEN : Use the 1 M bit ROM SHORT : Use the 4 M bit ROM	OPEN

1-10-7. VPR-12 board



VPR-12 A SIDE

Ref No.	Description	Factory setting
SL200	Factory use	OPEN

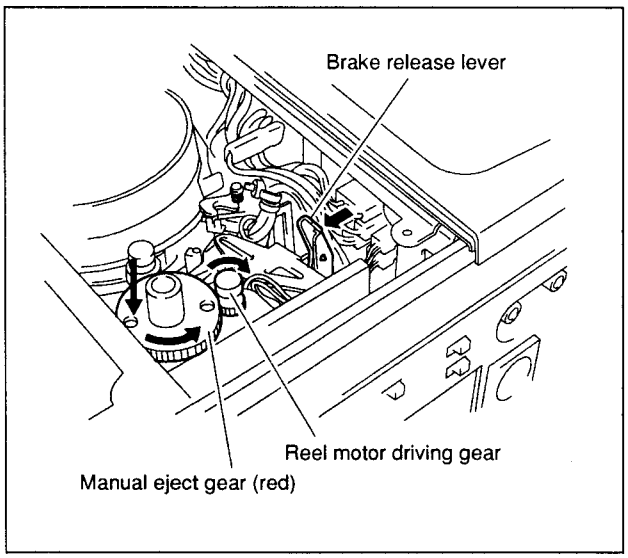
1-11. Ejecting the Cassette Tape Manually

If the cassette tape cannot be ejected or the cassette compartment does not rise up due to a trouble occurs, perform the following procedures to eject the cassette tape.

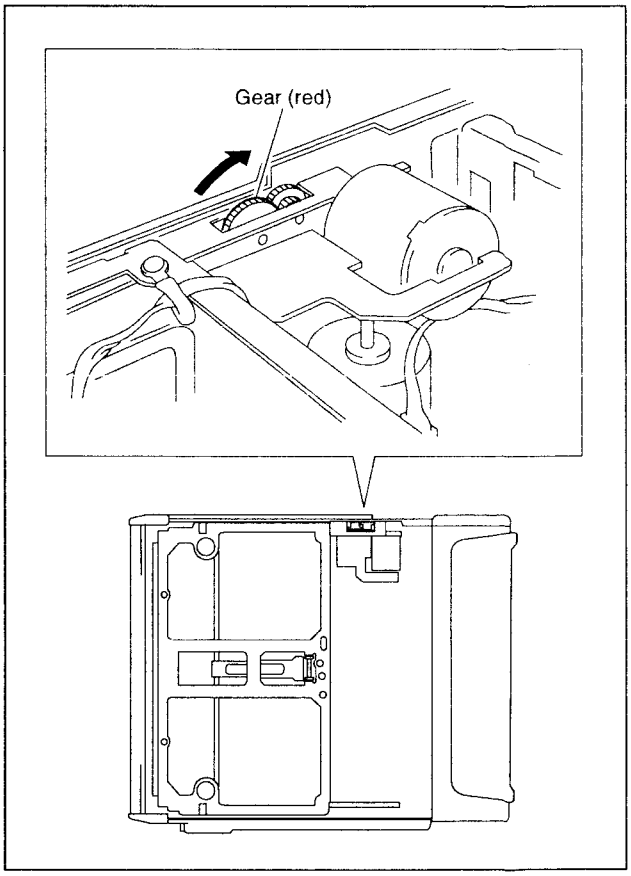
CAUTION

Be sure to turn the power off, and disconnect the power cord.

1. Remove the top panel.(Refer to "1-5. Removal/ Installatin of Cabinet".)
2. Pushing downward and turn the manual eject gear (red) fully counterclockwise while pulling the brake release lever in the direction of the arrow. And then the tape is taken up in the cassette. If not, turn the reel motor driving gear to clockwise while pulling the brake release lever in the direction of the arrow.



3. Turn the gear (red) of the cassette compartment in the direction of the arrow. The cassette compartment is raise-up and eject the cassette tape.



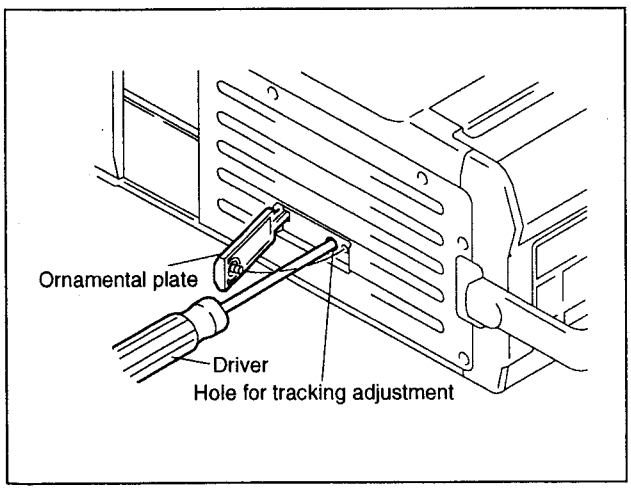
1-12. Cleaning when the Heads are Clogged

How to clean the video head when the heads are clogged, refer to "5-1-2. Cleaning of Tape Running Surface of Upper Drum and Video Heads".
If it recommended to clean the video heads periodically to avoid head clogging.

1-13. Tracking Adjustment

When perform the tracking adjustment, perform the following steps.

1. Set the setup menu as follows. (Refer to Section 3-1.)
   PAGE:<TRACKING>
   ITEM:AUTO TR → OFF
2. Remove the screw and open the ornamental plate.
3. Put the driver into the hole for tracking adjustment, and adjust the tracking.



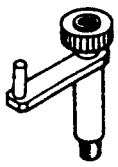
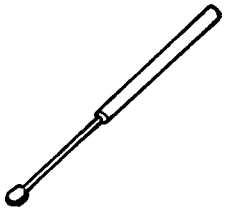
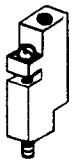
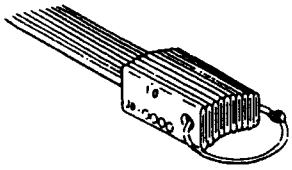
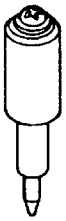
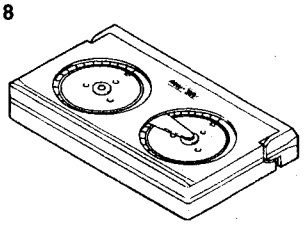
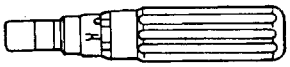
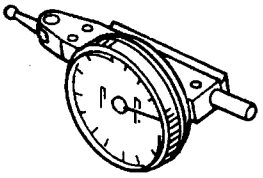
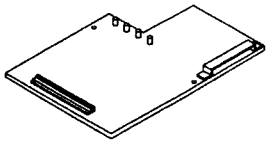
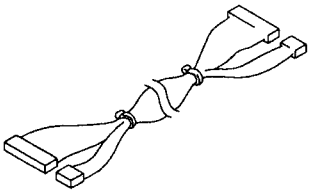
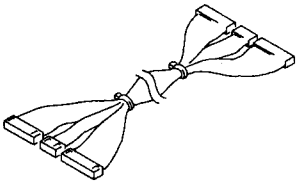
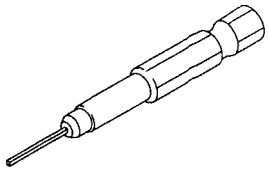
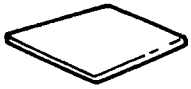
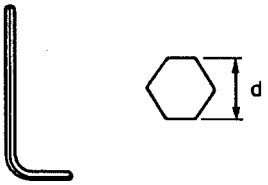
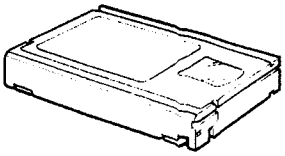
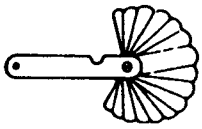
1-14. Optional Accessories

1-14-1. Optional Accessories

Soft carrying case	:	BKDW-250
Battery	:	BP-L60
		BP-90A
AC Power adaptor	:	AC-550(for UC)
		AC-550CE(for SY)
Battery Charger	:	BC-L100(for UC)
		BC-L100CE(for SY)
		BC-410(for UC)
		BC-410CE(for SY)
Video cassette tape	:	BCT-D series
Remote controller	:	BVR-3
RF modulator	:	REU-89UCA(for UC)
		RFU-89EAU(for SY)

1-14-2. Fixture

Fig. No.	Part No.	Description	For use
1	J-6001-820-A	Upper Drum Eccentricity Adjustment Tool(3)	Upper drum eccentricity adjustment
2	J-6001-830-A	Upper Drum Eccentricity Adjustment Tool(2)	
3	J-6080-840-A	Small Mirror	Tape path adjustment
4	J-6087-000-A	Upper Drum Eccentricity Adjustment Tool(5)	Upper drum eccentricity adjustment
5	J-6152-450-A	Wire Clearance Gauge Set	Clearance check
6	J-6321-500-A	Tape Guide Adjustment Driver	Tape guide height adjustment
7	J-6323-530-A	Stop Washer Fastening Tool	Installation of stop washer
8	J-6323-890-A	FWD Back Tension Measuring Cassette	FWD back tension adjustment
9	J-6325-110-A	Torque Screwdriver's Bit(for M1.4)	Tightening screws
	J-6325-380-A	Torque Screwdriver's Bit(for M2)	
10	J-6325-400-A	Torque Screwdriver(for 3 kg)	
11	J-6325-530-A	Upper Drum Eccentricity Adjustment Tool(6)	Upper drum eccentricity adjustment
12	J-6326-120-A	Hexagon Bit	Tightening screws
13	J-6421-330-A	Extension Board, BC-133	DIF-31 board check
14	J-6421-430-A	Extension Harness, VIDEO	Board check
15	J-6421-440-A	Extension Harness, AUDIO	
16	J-7031-460-A	Torque Screwdriver's Hexagonal Bit (across 1.27)	Tightening screws
17	2-034-697-00	Cleaning Piece	Cleaning
18	7-661-018-18	Mitsubishi Diamond Machine oil Hydro Fluid NT-68 (50 ml bottle)	Lubricating
19	7-700-736-05	L-shaped Hexagonal Wrench (d=1.5 mm)	Removal of screw
20	8-960-073-01	Alignment Tape,ZR5-1	Digital video and audio adjustment (for NTSC)
	8-960-073-11	Alignment Tape,ZR2-1	Tracking adjustment(for NTSC)
	8-960-073-51	Alignment Tape,ZR5-1P	Digital video and audio adjustments (for PAL)
	8-960-073-61	Alignment Tape,ZR2-1P	Tracking adjustment(for PAL)
21	9-911-053-00	Thickness Gauge	Clearance check
22	9-919-573-01	Cleaning Fluid	Cleaning
	Standard Products	Cleaning Tape,BCT-D12CL or BCT-5CLN	Cleaning
		Blank Tape,BCT-D40	Electrical adjustment
		Blank Tape,BCT-D124L	Tape path adjustment

1 	2	3 	4 
5 	6	7 	8 
9	10 	11 	12
13 	14 	15 	16 
17 	18	19 	20 
21 	22		

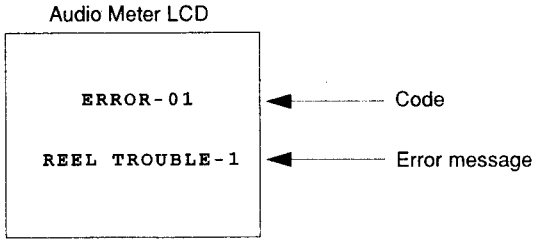
1-14-3. Measuring Equipment

Equipment	Model
AC Adapter or Battery	Sony AC-550 (for UC) /550CE (for SY) or equivalent
Oscilloscope	Tektronix 2465B or equivalent
Analog Composite Signal Generator	Tektronix 1410 (for NTSC) /1411 (for PAL) or equivalent
Waveform Monitor/Vectorscope	Tektronix 1750 (for NTSC) /1751 (for PAL) or equivalent
Digital Voltmeter	Advantest TR6845 or equivalent
Audio Level Meter	Hewlett Packard HP 3400A or equivalent
Audio Analyzer	Tektronix AA501A (OP.02) or equivalent
Audio Oscillator	Tektronix SG-5010 or equivalent
Audio Noise Meter	READER LMV-189AR or equivalent
Audio Distortion Meter	Tectronix AA5010 or equivalent
Monitor	Sony BVM-1410 or equivalent
Frequency Counter	Advantest TR5821AK or equivalent

Section 2
Error Messages

2-1. Error Message

This unit features self-diagnostics.
When trouble is detected, an error code and error message are displayed immediately in the audio meter LCD on the front panel.



Code	Error message	Description
01	REEL TROUBLE 1	The slack of the tape is detected during threading or unthreading
02	REEL TROUBLE 2	The slack or breaking of the tape is detected in search, fast forward, or rewind mode.
03	REEL TROUBLE 3	The slack or breaking of the tape is detected in playback or recording mode, or either of the lock of the supply or take-up reel is detected.
04	REEL TROUBLE 4	It is detected that the tape does not run at the speed of designation in fast forward or rewind mode.
05	REEL TROUBLE 5	It is detected that the supply or take-up reel cannot stop with a cassette is not inside, or detected thatover current has been flowing to supply and take-up reels.
06	TAPE TENSION ERROR	Excessive tension is detected.
07	CAPSTAN TROUBLE	It is detected that the tape does not run at the speed of designation in search or playback mode.
08	DRUM TROUBLE	It is detected that drum motor rotation is not normal.
09	THREAD MOTOR TIME OUT	It is detected that threading or unthreading is not completed within the prescribed time.
0A	THREADING TROUBLE	It is detected that threading cannot be done.
10	HUMID	Condensation is detected.
11	TAPE TOP/END SENSOR TROUBLE	Tape top and end are detected at the same time.
12	TAPE TOP SENSOR TROUBLE	The tape top sensor operation is defective.
13	TAPE END SENSOR TROUBLE	The tape end sensor operation is defective.
20	CASSETTE COMPARTMENT MOTOR LOCK	It is detected that cassette up/down operation is not completed within the prescribed time.
93	CPU INITIALIZE ERROR sub error message SY SV	Abnormal conditions are encountered during system initialize after the POWER switch is turned ON. SY:IC15/SST-3 board SV:IC404/SST-3 board
96	RAM TROUBLE	The checksum error arise in the RAM with battery backup for system control. IC28/SST-3 board
97	SV NV-RAM TROUBLE	The checksum error arise in the NV-RAM for servo. IC405/SST-3 board

Section 3
Maintenance Mode

3-1. Setup Menu

The DVW-250/250P has the setup menu required for the setting of function, etc.
This menu has the tree structure.
Enclose the PAGE in angle bracket on the audio meter LCD.

Operation

1. Activate the setup menu
   Press the DISPLAY button once or twice until the setup menu appears on the audio meter LCD.

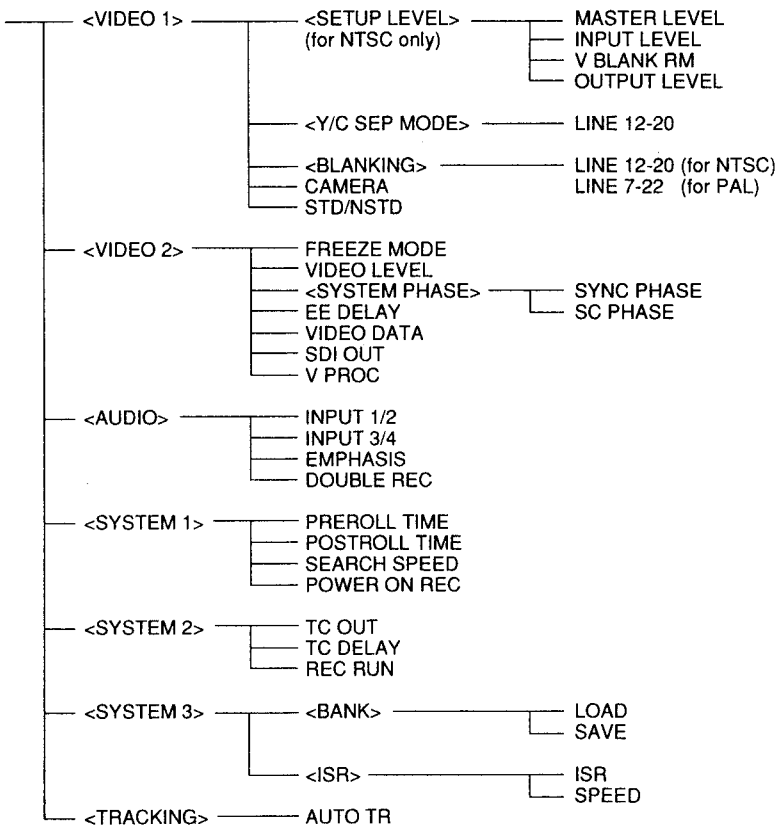
2. Selection of PAGE
   Select the PAGE by pressing the UP or DOWN button. (Align the asterisk cursor.) Press the SET button.
   Repeat selection of PAGE until the ITEM is found.

3. Selection of ITEM
   Select the ITEM by pressing the UP or DOWN button. (Align the asterisk cursor.) Press the SET button.

4. Setting of the ITEM
   Change the setting data by pressing the UP or DOWN button.

   Press the SET button when the changing data is written.

5. Exit the setup menu
   Press the DISPLAY button several times.



Audio Meter LCD	Discription
VIDEO 1	(for NTSC only)
<SETUP LEVEL> <Y/C SEP MODE> <BLANKING>	
CAMERA	..... Select input signal from camera. ANA : Y/R-Y/B-Y signal DIGI : digital signal AUTO: Select automatically, depending on whether camera is outputtinga digital signal.
STD/NSTD	..... Select standard/nonstandard composite input signal. AUTO: Select automatically, depending on whether luminance and chrominance signals are interleaved. STD : Always use standard signal. NSTD: Always use nonstandard signal. It the color frameing of the input video signal is unstable, select NSTD.
EXIT	
SETUP LEVEL	
MASTER LEVEL	..... Master level 0.0 % to 10.0 % in 0.5 % steps
INPUT LEVEL	..... Setup level of input signal 0.0 % to 10.0 % in 0.5 % steps MST : same value as master level
V BLANK RM	..... Setup elimination in vertical blanking interval OFF : no setup elimination ON : Carry out setup elimination.
OUTPUT LEVEL	..... Setup level of output signal 0.0 % to 10.0 % in 0.5 % steps MST : same value as master level
EXIT	
Y/C SEP MODE	..... Toggle Y/C separation for each line.
LINE 12 to 20	BPF : Carry out Y/C separation. B/W : no Y/C separation; treat as Y signal
EXIT	
BLANKING	..... Toggle blanking for each input line.
LINE 12 to 20 (for NTSC) LINE 7 to 20 (for PAL)	THRU: no blanking BLNK : blank input line
VIDEO 2	
FREEZE MODE	..... Select freeze mode. FLD : Freeze single field. FRM : Freeze frame
VIDEO LEVEL	..... Set the video output level. -3 dB to +3dB in 0.1dB steps
<SYSTEM PHASE>	
EE DELAY	..... Select the sync phase in E-E mode. SYNC: Output in phase with playback. VID : in phase with E-E signal
VIDEO DATA	..... Set the word length for digital video output signals. 8 or 10 bits
SDI OUT	..... Toggle serial digital output on and off. ON : output OFF : no output
V PROC	..... Select whether or not video signal accords to CF information. OFF : According to CF ON : no according to CF (no H shift)
EXIT	

Audio Meter LCD	Discription
SYSTEM PHASE	
SYNC PHASE	..... Adjust the phase of the sync signal.
	-7 to +7 in 1 sc steps.
SC PHASE	..... Adjust the subcarrier phase of the sync signal.
	0 to 965 in 0.29 ms steps.
EXIT	
AUDIO	
INPUT 1/2	..... Select audio input for channels 1 and 2 when digital video input is selected.
	ANA : analog audio input DIGI : digital audio input
INPUT 3/4	..... Select audio input for channels 3 and 4 when digital video input is selected.
	ANA : analog audio input DIGI : digital audio input
EMPHASIS	..... Toggle emphasis on analog audio input.
	OFF : no emphasis ON : Apply emphasis.
DOUBLE REC	..... Toggle simultaneous recording of audio channels 1 and 2 on channels 3 and 4.
	OFF : Record separate signals on channels 1/2 and 3/4. ON : Record same signals on channels 1/2 and 3/4.
EXIT	
SYSTEM 1	
PREROLL	..... Set the preroll time for editing using the REMOTE connector.
	0 to 10 seconds in 1 second steps
POSTROLL	..... Set the postroll time for editing using the REMOTE connector.
	0 to 10 seconds in 1 second steps
SEARCH	..... Select the tape speed in search operations.
	(Both forward and reverse) X2 : 2 times normal speed X5 : 5 times normal speed X8 : 8 times normal speed
P-ON REC	..... Select whether to start recording automatically at power on.
	OFF : Do not start recording. ON : Start recording.
EXIT	
SYSTEM 2	
TC OUT	..... Select the signal output from the TC OUT connector.
	GEN : time code produced by the time code generator. AUTO: during recording (including E-E mode),the time code produced by the time code generator, during playback, the LTC signal from the tape.
TC DELAY	..... Toggle the LTC phase correction for the output from the TC OUT connector.
	OFF : no phase correction to LTC signal AUTO: Adjust phase of LTC signal to correspond to the video output.
REC RUN	..... Select time code recorded when F-RUN/R-RUN switch set to R-RUN.
	INT : time code produced by time code generator TAPE : time code played back from tape
EXIT	

Audio Meter LCD	Discription
BANK	
LOAD	..... Read in the setup data from a memory bank. 0 : factory default setup data 1 : setup data from bank 1 2 : setup data from bank 2 3 : setup data from bank 3
SAVE	..... Save the current setup data in a memory bank. 1 : Save in bank 1. 2 : Save in bank 2. 3 : Save in bank 3.
EXIT	
ISR	
ISR	..... Select whether to use REMOTE connector for ISR. OFF : no ISR; use as Sony 9-pin protocal interface. ON : use as ISR interface.
SPEED	..... Set data transmission speed in ISR mode. 19200, 9600, 4800, 2400 or 1200 bps
EXIT	
TRACKING	
AUTO TR	..... Select whether to carry out auto tracking. OFF : no auto tracking ONE : auto tracking once, when tape is loaded ON : continual auto tracking
EXIT	

3-2. DIAG Menu

The DVW-250/250P has the DIAG menu required for the adjustment and diagnostics.
This menu has the tree structure.
Enclose the PAGE in angle bracket on the audio meter LCD.

When adjust servo or RF using the DIAG menu, turn S151-1 (F-1) switch on SST-3 board to ON.

Operation

1. Activate the DIAG menu
   Push the DIAG button to activate the DIAG menu.

2. Selection of PAGE
   Select the PAGE by pressing the UP or DOWN button. (Align the asterisk cursor.)
   Press the SET button.
   Repeat selection of PAGE until the ITEM is found.

3. Selection of ITEM
   Select the ITEM by pressing the UP or DOWN button. (Align the asterisk cursor.)
   Press the SET button.

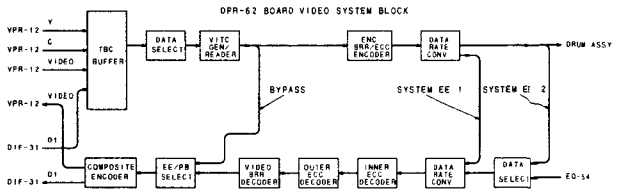
   Blinking the setting data.

4. Setting of the ITEM
   Change the setting data by pressing the UP or DOWN button.

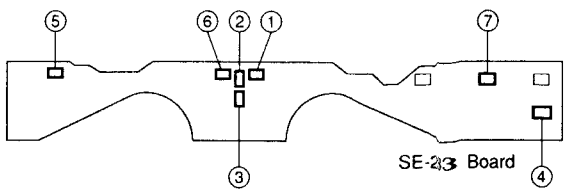
   Press the SET button when the changing data is written.
   Press the DISPLAY button when return to the initial data.

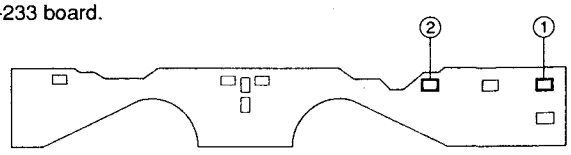
5. Exit the DIAG menu
   Press the DIAG button.

*1: When the DIAG menu activates under the dotted line, turn S151-1 (F-1) on the SST-3 board to ON before activating the DIAG menu.

Audio Meter LCD	Discription
HOURS METER 1	The contents of the following are displayed.
POWER ON xxxxxxH	..... Accumulated power ON time.
DRUM ROTATE xxxxxxH	..... Accumulated drum running hours.
SET KEY — NEXT	
HOURS METER 2	
TAPE RUN xxxxxxH	..... Accumulated tape running hours.
TAPE THREAD xxxxxxTIMES	..... Accumulated number of threading/unthreading cycle.
SET KEY — EXIT	
BATTERY	
ALARM 12.5V	..... Battery alarm voltage setting.
EXIT	
VERSION	Display software versions.
SYS VERSION 1.31	..... System Control IC (IC24/SST-3 board)
SERVO VERSION 1.03	..... Servo IC (IC413/SST-3 board)
SET KEY — EXIT	
CHARA	
POSITION LOW	..... Set the character position superimposed to output signal from the VIDEO OUT 2 connector. LOW : Lower portion on the monitor screen HI : Higher portion on the monitor screen
TYPE A	..... Set the character type superimposed to output signal from the VIDEO OUT 2 connector. A : White letters with black background B : White letters with black outline
EXIT	
PROC1	
SYSTEM EE OFF	..... Select the bypass mode of digital signal (for check). OFF : Normal operation mode BYPS : BYPASS EE mode SYS1 : SYSTEM EE 1 mode SYS2 : SYSTEM EE 2 mode 
VIDEO TEST OFF	..... Select the output of the internal video test signal. (The video test is not functioned during the SAVE mode.) OFF : No outputs 1 : 100% Color Bars 2 : 75% Color Bars 3 : 75% Reverse Color Bars 4 : Bowtie 5 : Pulse and Bar 6 : Multi Burst 7 : H Sweep 8 : 5 Step 9 : Ramp 10 : Shallow Ramp 11 : Red 12 : 50% Flat 13 : 100% Flat 14 : Black Burst 15 : Pathlogical Check Code 16 : NTC7 (for NTSC) /LINE330 (for PAL)

Audio Meter LCD	Discription
AUDIO TEST OFF EXIT	Select the output of the internal audio test signal.(The audio test is not functioned during the SAVE mode.) OFF : No outputs 1 : 1 kHz, 0 dB 2 : 1 kHz, -20 dB
DPR VR REF FLD 80 REF SCH 80 INT 4FSC 80 EXIT	Use DPR-62 board adjustment. (Refer to "5-7. VIDEO Adjustment–2" of maintenance manual part 2.) ..... Reference 1'st Field Adjustment ..... Reference SCH Adjustment ..... Internal 4fsc Frequency Adjustment
VPR VR1 Y LEVEL R-Y LEVEL B-Y LEVEL EXIT	Use VPR-12 board adjustment. (Refer to "5-7. VIDEO Adjustment–2" of maintenance manual part 2.) ..... Input Y Level Adjustment ..... Input R-Y Level Adjustment ..... Input B-Y Level Adjustment
VPR VR2 Y PHASE Y/R-Y DELAY Y/B-Y DELAY EXIT	Use VPR-12 board adjustment. (Refer to "5-7. VIDEO Adjustment–2" of maintenance manual part 2.) ..... Y Phase Adjustment ..... Skew Adjustment (Y, R-Y) ..... Skew Adjustment (Y, B-Y)
VPR VR3 VIDEO IN 80 INPUT CF 80 VIDEO OUT 80 EXIT	Use VPR-12 board adjustment. (Refer to "9-7. VIDEO Adjustment–2".) ..... Input Video Level Adjustment ..... Input Video Color Framing Adjustment ..... Output Video Level Adjustment
A/Ech CH-CONDITION □ □ □ AMP PHS REC Ach: xx xx xx Ech: xx xx xx EXIT (B/Fch, C/Gch, D/Hch: Same as A/Ech)	Use RF (A/Ech) adjustment. (Refer to "9-5. RF Adjustment".) ..... Check the channel condition of A/Ech. Adjust that only leftmost square on the LCD lights up. ..... Adjustment data of A/Ech AMP : Amplitude data PHS : Phase data REC : Recording current data
AUTO ADJUST AMP ADJ OFF PHS ADJ OFF REC ADJ OFF EXIT	Use RF Adjustment. (Refer to "9-5. RF Adjustment".) ..... Amplitude Adjustment ..... Phase Adjustment ..... Recording current Adjustment
NV-RAM RECALL SAVE EXIT	Save RF adjustment data (Refer to "5-5. RF Adjustment".) ..... Return the factory-setting value. ..... Save the adjustment data.
CASSETTE SW1 1:0 2:0 3:0 4:0 5:0 6:0 7:0	Check the operation of the sensor on the SE-233 board. 1 : Activate the sensor 0 : Deactivate the sensor ..... Tape thickness sensor ..... Metal/oxide tape sensor ..... Analog/digital tape sensor ..... L cassette REC inhibit sensor ..... S cassette REC inhibit sensor ..... Reel hub diameter sensor ..... L cassette sensor



Audio Meter LCD	Discription
CASSETTE SW2	Check the operation of the sensor on the SE-233 board. 1 : Activate the sensor 0 : Deactivate the sensor  SE-233 Board
1:0 ..... Spare 2:0 ..... Cleaning tape detect sensor 3:0 ..... (Not use) 4:0 ..... (Not use)	
CASSETTE COMP.SW	Check the operation of the sensor in the cassette compartment. 1 : Activate the sensor 0 : Deactivate the sensor
1:0 ..... Cassette-in sensor	
TOP/END SENSOR	Check the operation of the top/end sensors. 1 : Activate sensor 0 : Deactivate sensor
1:0 ..... Tape end sensor 2:0 ..... Tape top sensor	
TENSION SENSOR	Display the tape tension in hexadecimal digit.
1:xxxx ..... S tension regulator arm sensor	
CASSETTE COMP.	Check the operation of the cassette compartment and cassette up/down sensors. Push the F.FWD button : Move downward the cassette compartment. (Enabled when the cassette-in sensor is set to ON.) Push the REW button : Move upward the cassette compartment.
1:0 ..... Cassette-down sensor	1 : Activate sensor 0 : Deactivate sensor
2:0 ..... Cassette-up sensor	1 : Activate sensor 0 : Deactivate sensor
THREADING	Check the operation of the threading and threading sensor. Push the F.FWD button : thread Push the REW button : unthread
1:0	Threading sensor 1 : Activate sensor 0 : Deactivate sensor
2:0	Unthreading sensor 1 : Activate sensor 0 : Deactivate sensor
S REEL MOTOR	Check the operation of the S reel motor. Push the F.FWD button : Motor rotates clockwise. (Increase in the hexadecimal digit.) Push the REW button : Motor rotates counterclockwise. (Decrease in the hexadecimal digit.) Push the STOP button : Motor stops.
1:xxxx (hexadecimal digit)	
T REEL MOTOR	Check the operation of the T reel motor Push the F.FWD button : Motor rotates clockwise. (Increase in the hexadecimal digit.) Push the REW button : Motor rotates counterclockwise. (Decrease in the hexadecimal digit.) Push the STOP button : Motor stops.
1:xxxx (hexadecimal digit)	
CAPSTAN MOTOR	Check the operation of the capstan motor. Push the F.FWD button : Motor rotates clockwise. (Increase in the hexadecimal digit.) Push the REW button : Motor rotates counterclockwise. (Decrease in the hexadecimal digit.) Push the STOP button : Motor stops.
1:xxxx (hexadecimal digit)	

Audio Meter LCD	Discription
DRUM MOTOR SPEED : OK PHASE : LOCK PG :EXIST	Check the operation of the drum motor. Push the F.FWD button : Motor rotates. (Start the check automatically.) Push the STOP button : Motor stops.
PINCH ROLLOR	Check the operation of the pinch rollor. Push the F.FWD button : Pinch rollor activates. (Enabled when the threading-end sensor is set to ON.) Push the STOP button : Pinch rollor returns to the former position.
S REEL BRAKE	Check the operation of the S reel brake. Push the F.FWD button : S reel brake activates. Push the STOP button : S reel brake returns to the former condition.
T REEL BRAKE	Check the operation of the T reel brake. Push the F.FWD button : T reel brake activates. Push the STOP button : T reel brake returns to the former condition.
CLEANING ROLLER	Check the operation of the cleaning roller. Push the F.FWD button : Operates and immediately returns to the former condition.
ADJUST <INIT> ..... Adjustment data initialize <TRACON VR> ..... Click position correction of tracking volume <CAP FG DUTY> ..... Capstan FG duty adjustment <CAP SPEED> ..... Capstan free speed adjustment <DRUM PG> ..... Drum PG phase adjustment <SAVE> ..... Save servo adjustment data EXIT	Use servo system Adjustment. (Refer to "9-3. Servo Adjustment".)
PATH CTL PHS PB ..... Select the phase locked servo control in playback mode. PB : Normal condition REC: The phase is locked same phase as recording mode. TEST SG OFF ..... Select the test signal for recording. OFF: Normal operation mode A0 : A,C,E,Gch...2 MHz B,D,F,Hch...No signals A1 : A,C,E,Gch...4 MHz B,D,F,Hch...No signals A2 : A,C,E,Gch...8 MHz B,D,F,Hch...No signals A3 : A,C,E,Gch...16 MHz B,D,F,Hch...No signals B0 : A,C,E,Gch...No signals B,D,F,Hch...2 MHz B1 : A,C,E,Gch...No signals B,D,F,Hch...4 MHz B2 : A,C,E,Gch...No signals B,D,F,Hch...8 MHz B3 : A,C,E,Gch...No signals B,D,F,Hch...16 MHz C0 : A,B,C,D,E,F,G,Hch...2 MHz C1 : A,B,C,D,E,F,G,Hch...4 MHz C2 : A,B,C,D,E,F,G,Hch...8 MHz C3 : A,B,C,D,E,F,G,Hch...16 MHz D0 : A,Ech...2 MHz B,C,D,F,G,Hch...No signals D1 : A,Ech...2 MHz B,C,D,F,G,Hch...No signals D2 : A,Ech...2 MHz B,C,D,F,G,Hch...No signals D3 : A,Ech...2 MHz B,C,D,F,G,Hch...No signals EXIT	

Section 4
Block Diagrams and Circuit Description

Circuit Description

This unit records and reproduces video and audio signals on the tape in a digital Betacam format. To reduce an acoustic noise, this unit decreases the number of drum revolutions to a half of a broadcast machine and doubles the recording heads (eight).

Recording System

A video input signal is one of the signals below.
- Composite video signal
- Y/R-Y/B-Y signal
- SDI(D1 format serial digital) video signal

An audio input signal is one of the signals below.
- Analog audio signal (Line audio and camera mic)
- SDI(D1 format serial digital) audio signal

The composite video signal input to the VPR-12 board is converted from analog to digital, then Y/C-separated using a composite decoder. The separated Y and C signals are then multiplexed and sent to the TBC buffer on the DPR-62 board.
Y, R-Y, and B-Y signals are converted from analog to digital. After that, the R-Y and B-Y signals are multiplexed and sent to the TBC buffer on the DPR-62 board together with the Y signal.
The SDI signal input to the DIF-31 board is parallel-converted, then separated into video data and audio data. The video signal is sent to the TBC buffer on the DPR-62 board, and the audio data is sent to the audio processor on the DPR-62 board.

One of the three video input signals (digital video data) described above is selected by the TBC buffer on the DPR-62 board.
For the video data output from the TBC buffer, the setup is eliminated and the VITC is added. After that, the video data is compressed to a rate of 1/2 by a bit rate reduction & ECC encoder, and an outer ECC is added to the video data for track interleaving.

An input analog audio signal is converted from analog to digital on the ADA-44 board, then sent to the audio processor on the DPR-62 board.
For the audio data output from the audio processor, an outer ECC is added by an ECC encoder for field shuffling. The video data and audio data are then multiplexed, and the inner ECC is added. After that, the video data and audio data are separated to 2-channel parallel REC data. Using a data rate converter, the 2-channel parallel REC data is converted into 4-channel serial REC data whose clock frequency was converted into 1/2. The converted data is then sent to the drum and recorded.

During cue recording, the signal obtained when the analog audio signals in channels 1 to 4 were mixed is used as a cue signal. During cue dubbing, the analog audio signal in channel 4 is used as a cue signal.

Playback System

The PB RF signal sent from the drum is converted into 4-channel serial PB data by the PB equalizer and viterbi decoder on the EQ-54 board.

Using a data rate converter, the 4-channel serial PB data on the DPR-62 board is converted into 2-channel parallel PB data whose clock frequency is two times the normal.

Next, inner correction is performed using an inner ECC decoder, and the converted data is separated to video data and audio data.
The video data is outer-corrected using an outer ECC decoder and converted into the parallel video data of the former data rate using a bit rate reduction decoder. If an error that cannot be corrected using the ECC decoder exists, the error correction is performed. The video data output from the bit rate reduction decoder is converted into a composite parallel signal using a composite encoder. The converted signal is then converted into an analog composite video signal and SDI video signal.
The audio data is error-corrected after it is outer-corrected. The resultant data is passed through an audio processor, then converted into an analog audio signal and SDI audio signal.

The video output signal consists of a composite video signal and SDI video signal, and the audio output signal consists of an analog audio signal and SDI audio signal.
The monitor output signal consists of a composite video signal and analog audio signal and is sent to the camera and RFU as well as headphones and an earphone.

System Control and Servo Systems

The system control system operates the front panel and receives the command from the camera and external equipment so as to control and manage this unit.
This unit has two internal CPUs for system control and servo control and exchanges data between the system control and servo control by an SV/SY communication IC.
A 32-bit CPU with an operation clock of 10 MHz is used as the system control CPU, and a 16-bit CPU with an operation clock of 10 MHz is used as the servo control CPU. Both the 32-bit CPU and 16-bit CPU incorporate peripheral equipment to some degree, so they reduce the number of external circuits.
The system control CPU controls the time code (reader and generator), character generator, front panel key, liquid-crystal display, and signal processing system. The system control CPU also communicates with the camera and other external equipment.
The servo control CPU receives instructions from the system control CPU, detects the sensor and FG/PG states, and controls the drum and motor.
This unit is controlled from external equipment with Sony 9-pin protocol or ISR.

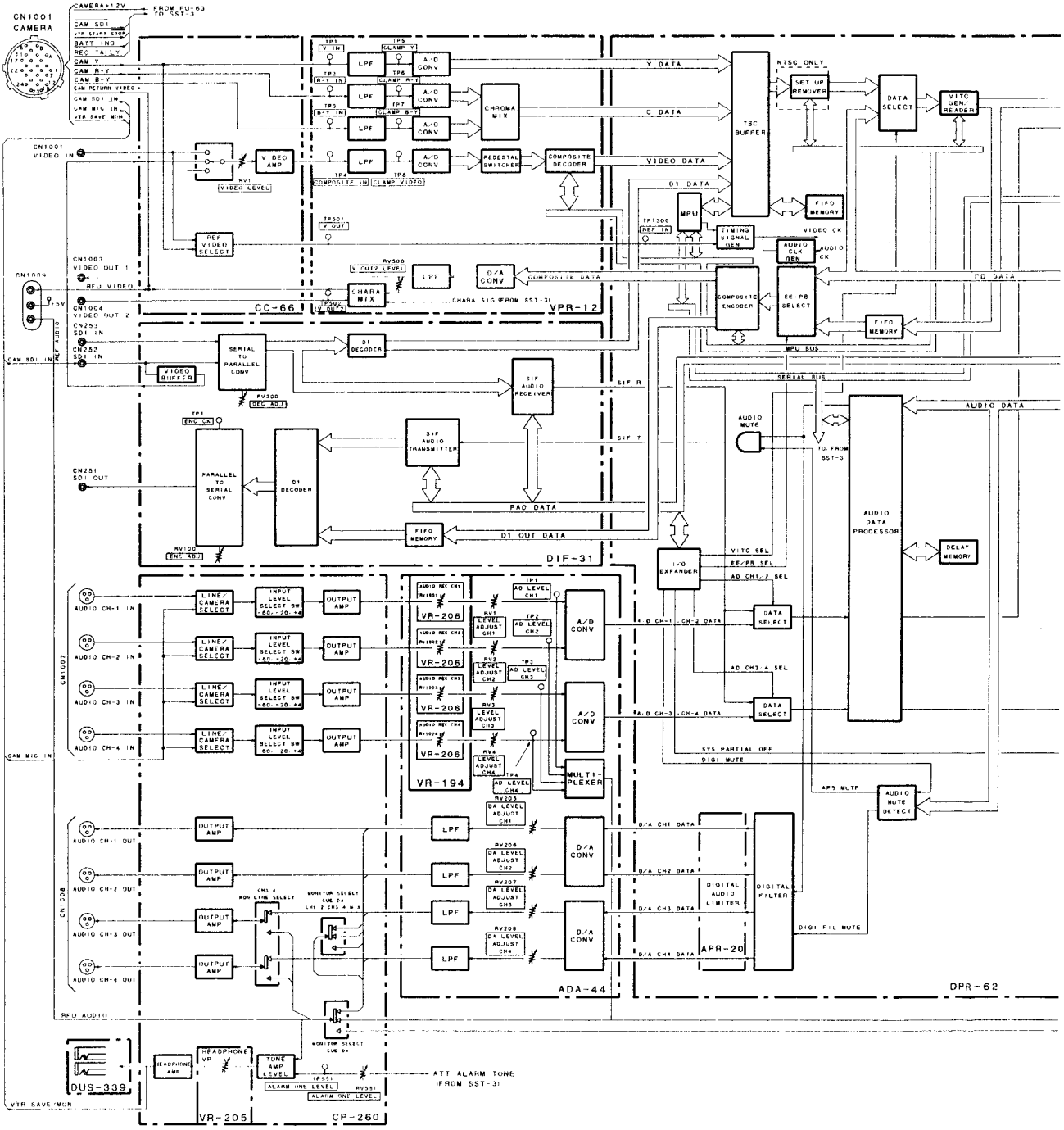
Power Supply System

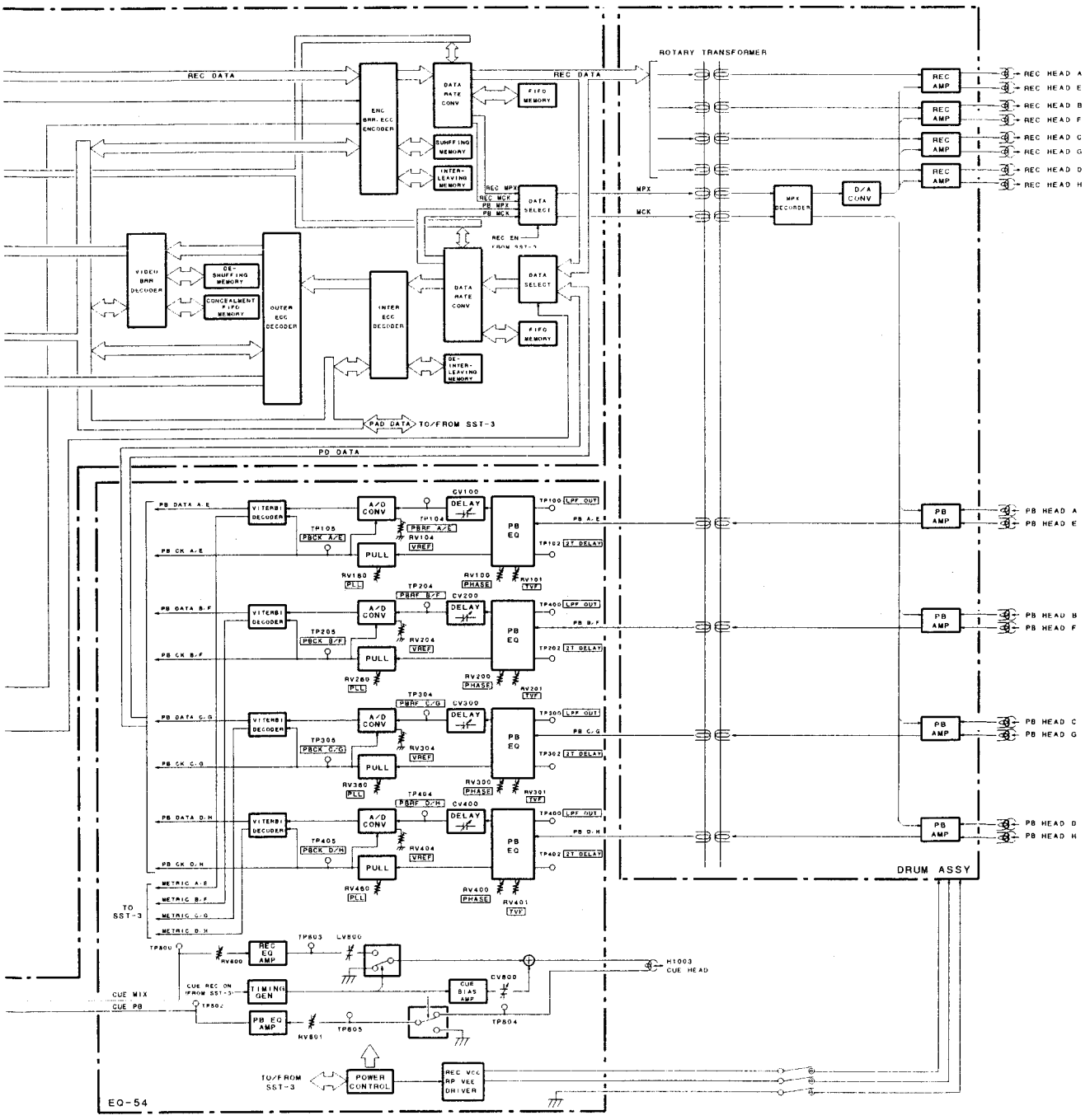
A voltage of 12 Vdc sent from the battery or DC IN connector is passed through the power selection circuit and breaker on the FU-63 board and sent to the DC/DC converter (on the PSW-31 board).
The DC/DC converter converts 12 Vdc into various DC voltages and sends them to each block of this unit and the external camera.
The major features of the DC/DC converter are as follows:

- A high-efficiency PWM switching regulator system is used as the converter system.
- An overcurrent protection circuit that cuts off the output of the voltage when an output pin was short-circuited is provided.
- A circuit that cuts off the output voltage when an input voltage became less than the guaranteed operating voltage is provided.
- Power is partially supplied to the SST-3 and CP-260 boards even if the power switch is turned off. This enables the remaining battery amount and alarm to be displayed with the power turned off.

The SST-3 board mounts an internal lithium battery, stores the RAM data, and drives the time code reader and generator (SST-3 board).

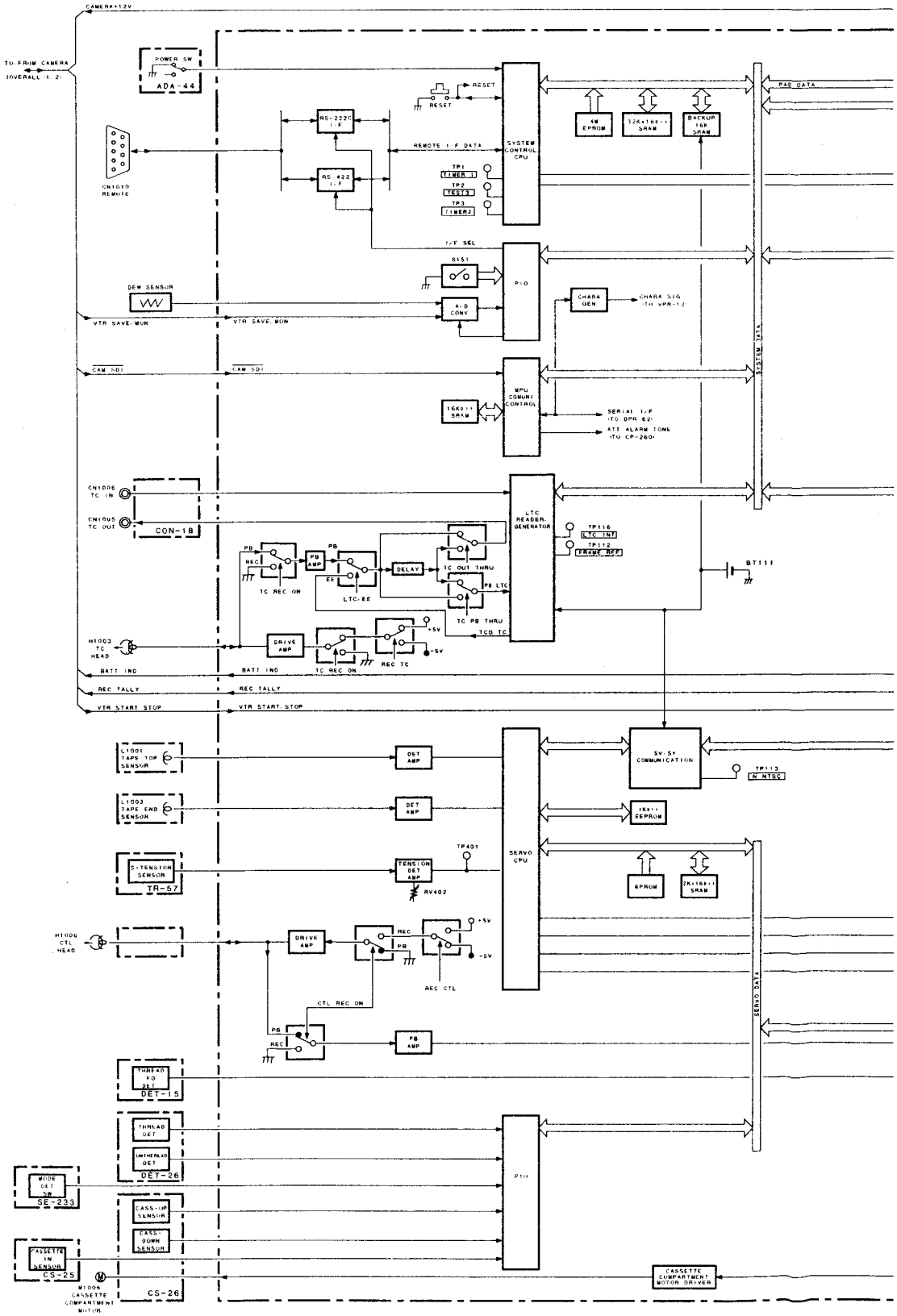
OVERALL (1/2)

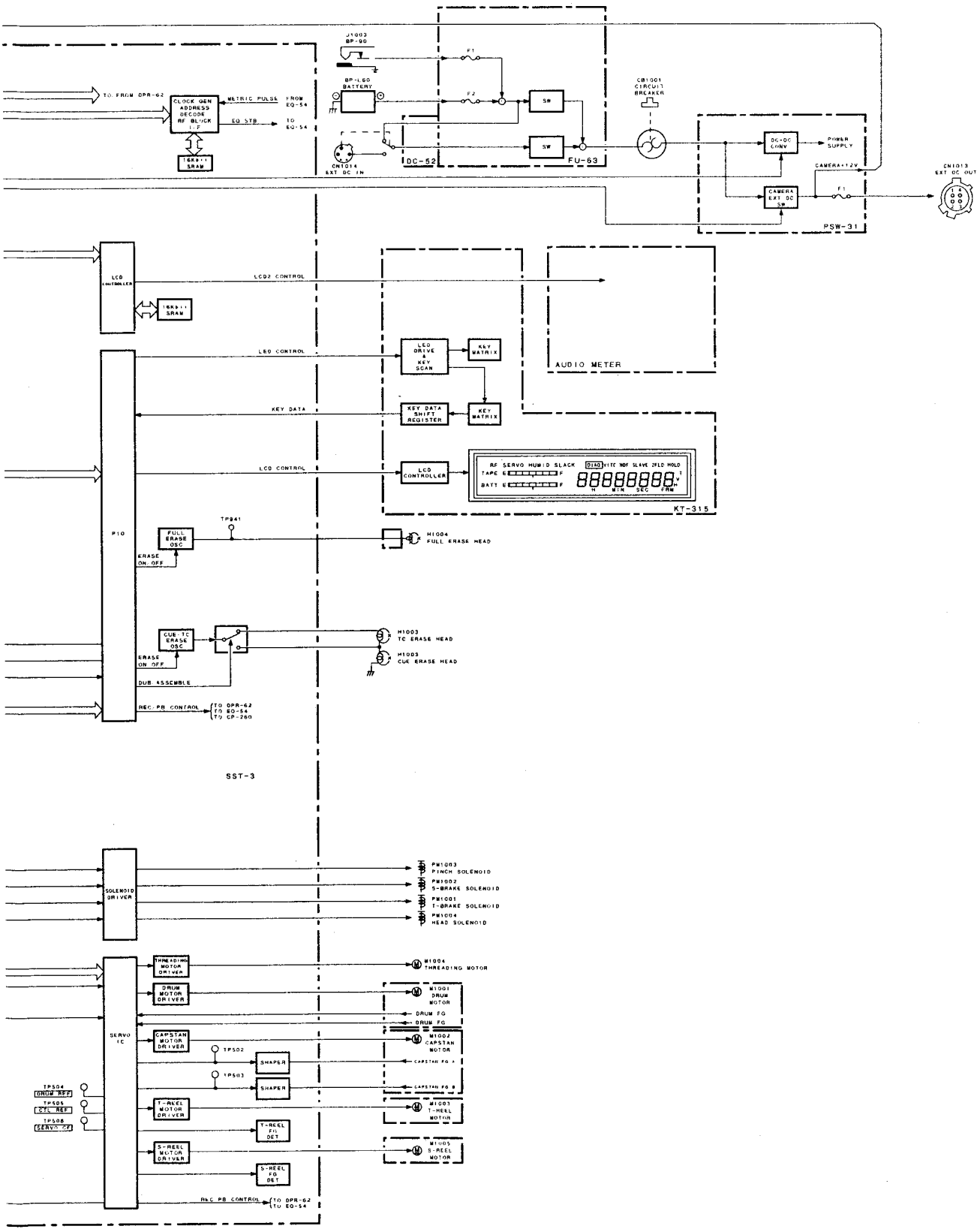

CN1001 CAMERA
CAMERA+12V
FROM FCU-63
TO SST-3
CAM SDI
VTR START STOP
BATT IND
REC TALLY
CAM Y
CAM R-Y
CAM B-Y
CAM RETURN VIDEO
CAM SDI IN
CAM MIC IN
VTR SAVE MON
CN1001 VIDEO IN
VIDEO AMP
VIDEO LEVEL
REF VIDEO SELECT
CN1003 VIDEO OUT 1
REF VIDEO
CN1004 VIDEO OUT 2
+5V
CN253 SDI IN
CN252 SDI IN
REF AUDIO
CAM SDI IN
VIDEO BUFFER
SERIAL TO PARALLEL CONV
D1 DECODER
SIF AUDIO RECEIVER
SIF R
SIF T
PAD DATA
D1 OUT DATA
FIFO MEMORY
ENC CK
PARALLEL TO SERIAL CONV
CN251 SDI OUT
SIF AUDIO TRANSMITTER
CC-66
VPR-12
DIF-31
Y DATA
C DATA
VIDEO DATA
D1 DATA
CHROMA MIX
PEDESTAL SWITCHER
COMPOSITE DECODER
TBC BUFFER
MPU
TIMING SIGNAL GEN
REF IN
VIDEO CK
AUDIO CLK GEN
AUDIO CK
COMPOSITE ENCODER
EE-PB SELECT
FD DATA
MPU BUS
SERIAL BUS
AUDIO MUTE
AUDIO DATA
TO/FROM SST-3
I/O EXPANDER
VITC SEL
EE/PB SEL
AD CH1,2 SEL
AD CH3,4 SEL
SYS PARTIAL OFF
DIGI MUTE
APS MUTE
AUDIO MUTE DETECT
AUDIO DATA PROCESSOR
DELAY MEMORY
MTSC ONLY
SET UP REMOVER
DATA SELECT
VITC GEN/READER
AUDIO CH-1 IN
AUDIO CH-2 IN
AUDIO CH-3 IN
AUDIO CH-4 IN
LINE/CAMERA SELECT
INPUT LEVEL SELECT SW
OUTPUT AMP
VR-206
VR-194
A/D CONV
MULTI-PLEXER
A/D CH1,2 DATA
A/D CH3,4 DATA
AUDIO CH-1 OUT
AUDIO CH-2 OUT
AUDIO CH-3 OUT
AUDIO CH-4 OUT
LPF
D/A CONV
D/A CH1 DATA
D/A CH2 DATA
D/A CH3 DATA
D/A CH4 DATA
DIGITAL AUDIO LIMITER
DIGITAL FILTER
DIGI FIL MUTE
APR-20
ADA-44
DPR-62
REF AUDIO
HEADPHONE VR
HEADPHONE AMP
TONE AMP LEVEL
ALARM TONE LEVEL
ATT ALARM TONE FROM SST-31
DUS-339
VR-205
CP-260
CN1007
CN1008


ROTARY TRANSFORMER
REC DATA
ENC
BAR-ECC
ENCODER
DATA
RATE
CONV
FIFO
MEMORY
SHUFFING
MEMORY
INTER-
LEAVING
MEMORY
REC MPX
REC MCK
PB MPX
PB MCK
DATA
SELECT
REC EN
FROM SST-3
REC
AMP
REC HEAD A
REC HEAD E
REC HEAD B
REC HEAD F
REC HEAD C
REC HEAD G
REC HEAD D
REC HEAD H
MPX
MCK
MPX
DECODER
D/A
CONV
VIDEO
BAR
DECODER
DE-
SHUFFING
MEMORY
CONCEALMENT
FIFO
MEMORY
OUTER
ECC
DECODER
INNER
ECC
DECODER
DE-
INTER-
LEAVING
MEMORY
PAD DATA
TO/FROM SST-3
PB DATA
PB DATA A/E
VITERBI
DECODER
A/D
CONV
CV100
DELAY
PB
EQ
TP100
LPF OUT
PB A/E
TP102
2T DELAY
TP105
PBCK A/E
TP104
PBRF A/E
RV104
VREF
PULL
RV180
PLL
RV100
PHASE
RV101
TVF
PB CK A/E
PB DATA B/F
TP204
PBRF B/F
CV200
TP400
LPF OUT
PB B/F
TP202
2T DELAY
TP205
PBCK B/F
RV204
VREF
PULL
RV280
PLL
RV200
PHASE
RV201
TVF
PB CK B/F
PB DATA C/G
TP304
PBRF C/G
CV300
TP300
LPF OUT
PB C/G
TP302
2T DELAY
TP305
PBCK C/G
RV304
VREF
PULL
RV380
PLL
RV300
PHASE
RV301
TVF
PB CK C/G
PB DATA D/H
TP404
PBRF D/H
CV400
TP400
LPF OUT
PB D/H
TP402
2T DELAY
TP405
PBCK D/H
RV404
VREF
PULL
RV480
PLL
RV400
PHASE
RV401
TVF
PB CK D/H
PB
AMP
PB HEAD A
PB HEAD E
PB HEAD B
PB HEAD F
PB HEAD C
PB HEAD G
PB HEAD D
PB HEAD H
DRUM ASSY
METRIC A/E
METRIC B/F
METRIC C/G
METRIC D/H
TO
SST-3
TP800
REC
EQ
AMP
RV800
TP803
LV800
H1003
CUE HEAD
CUE REC ON
FROM SST-3
TIMING
GEN
CUE MIX
CUE PB
TP802
CUE
BIAS
AMP
CV800
TP804
PB EQ
AMP
RV801
TP805
TO/FROM
SST-3
POWER
CONTROL
REC VCC
RP VEE
DRIVER
EQ-54

OVERALL (1/2)

OVERALL (2/2)


CAMERA+12V
TO/FROM CAMERA (OVERALL 1/2)
POWER SW
ADA-44
RESET
RS-232C I/F
RS 422 I/F
CN1010 REMOTE
REMOTE I/F DATA
SYSTEM CONTROL CPU
TP1 TIMER 1
TP2 TEST1
TP3 TIMER2
PAD DATA
4M EPROM
12K+16B+1 SRAM
BACKUP 16K SRAM
I/F SEL
S151
P10
DEW SENSOR
A-D CONV
CHARA GEN
CHARA SIG TO VPR-12
VTR SAVE/MON
CAM SDI
MPU COMUNI CONTROL
16KB+1 SRAM
SERIAL I/F TO DPR-62
ATT ALARM TONE TO CP-260
SYSTEM DATA
CN1006 TC IN
CN1005 TC OUT
CON-18
LTC READER/ GENERATOR
TP116 LTC INT
TP112 FRAME REF
BT151
PB
REC
PB AMP
TC REC ON
EE
LTC/EE
DELAY
TC OUT THRU
PB LTC
TC PB THRU
TCG TC
DRIVE AMP
REC TC
+5V
-5V
H1003 TC HEAD
BATT ING
REC TALLY
VTR START STOP
L1001 TAPE TOP SENSOR
L1003 TAPE END SENSOR
S-TENSION SENSOR
TR-57
DET AMP
TENSION DET AMP
TP401
RV402
5V.5V COMMUNICATION
TP113 N NTSC
16B+1 EEPROM
SERVO CPU
EPROM
2K+16B+1 SRAM
H1006 CTL HEAD
REC CTL
CTL REC ON
SERVO DATA
THREAD FD DET
DET-15
THREAD DET
UNTHREAD DET
DET-26
MODE DET SW
SE-233
CASS-UP SENSOR
CASS-DOWN SENSOR
CASSETTE IN SENSOR
CS-25
CS-26
M1006 CASSETTE COMPARTMENT MOTOR
P11
CASSETTE COMPARTMENT MOTOR DRIVER


J1003
BP-90
BP-L60
BATTERY
F1
F2
SW
SW
CB1001
CIRCUIT
BREAKER
CN1014
EXT DC IN
DC-52
FU-63
DC-DC
CONV
POWER
SUPPLY
CAMERA EXT DC SW
CAMERA+12V
F1
CN1013
EXT DC OUT
PSW-31
TO/FROM DPR-62
CLOCK GEN
ADDRESS
DECODE
RF BLOCK
I/F
METRIC PULSE
FROM EQ-54
EQ STB
TO EQ-54
16KBIT SRAM
LCD CONTROLLER
16KBIT SRAM
LCD2 CONTROL
LED CONTROL
KEY DATA
LCD CONTROL
LED DRIVE & KEY SCAN
KEY MATRIX
KEY DATA SHIFT REGISTER
KEY MATRIX
LCD CONTROLLER
AUDIO METER
KT-315
P10
FULL ERASE OSC
ERASE ON/OFF
TP941
M1004
FULL ERASE HEAD
CUE-TC ERASE OSC
ERASE ON/OFF
DUB ASSEMBLE
REC PB CONTROL
TO DPR-62
TO EQ-54
TO CP-260
M1003
TC ERASE HEAD
M1003
CUE ERASE HEAD
SST-3
SOLENOID DRIVER
PM1003
PINCH SOLENOID
PM1002
S-BRAKE SOLENOID
PM1001
T-BRAKE SOLENOID
PM1004
HEAD SOLENOID
SERVO I/C
THREADING MOTOR DRIVER
DRUM MOTOR DRIVER
CAPSTAN MOTOR DRIVER
T-REEL MOTOR DRIVER
S-REEL MOTOR DRIVER
M1004
THREADING MOTOR
M1001
DRUM MOTOR
DRUM FG
DRUM FG
M1002
CAPSTAN MOTOR
CAPSTAN FG A
CAPSTAN FG B
M1001
T-REEL MOTOR
M1005
S-REEL MOTOR
TP502
TP503
SHAPER
SHAPER
TP504
DRUM REF
TP505
CTL REF
TP508
SERVO CK
T-REEL FG DET
S-REEL FG DET
REC PB CONTROL
TO DPR-62
TO EQ-54

OVERALL (2/2)

Section 5
Periodic Maintenance and Inspection

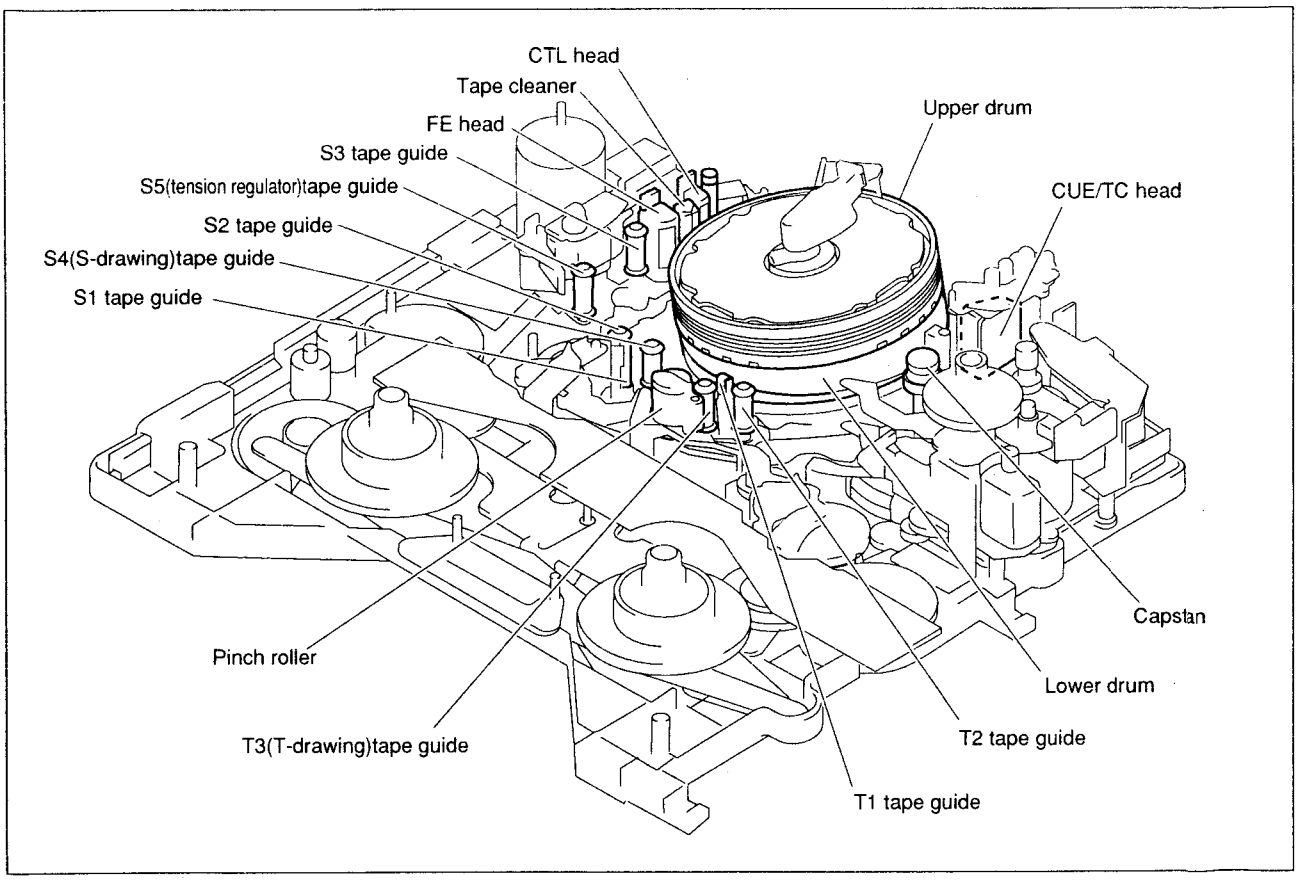
5-1. Cleaning

To make the most of the functions, fully realize the performances of this unit and to lengthen the life of the unit and tape, clean the parts often.

5-1-1. General Information for Cleaning

1. Index

In this section, explains the cleaning of parts as shown in the following figure.



2. Notes

- Be sure to turn the power off before cleaning.
- The blocks in the mechanical deck consist of the precision parts, and adjust precisely. Be careful not to damage the parts, and not to apply an excessive force during cleaning.
- Do not touch the greased portions during cleaning. If grease attaches to a cleaning piece, replace the cleaning piece by new one. If the cleaning piece smeared with grease used, grease may attach to the places where it should not.
- Do not insert a cassette tape before cleaning fluid completely evaporates.

3. Preparations

(1) Turn the power off.
(2) Remove the upper panel. (Refer to section 1-5.)

5-1-2. Cleaning of Tape Running Surface of Upper Drum and Video Heads

Notes

The upper drum and video heads are the parts that can damage easily.
Take care not to damage the upper drum and rotary heads during cleaning.

Tools

- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Note

Never use a cotton swab.

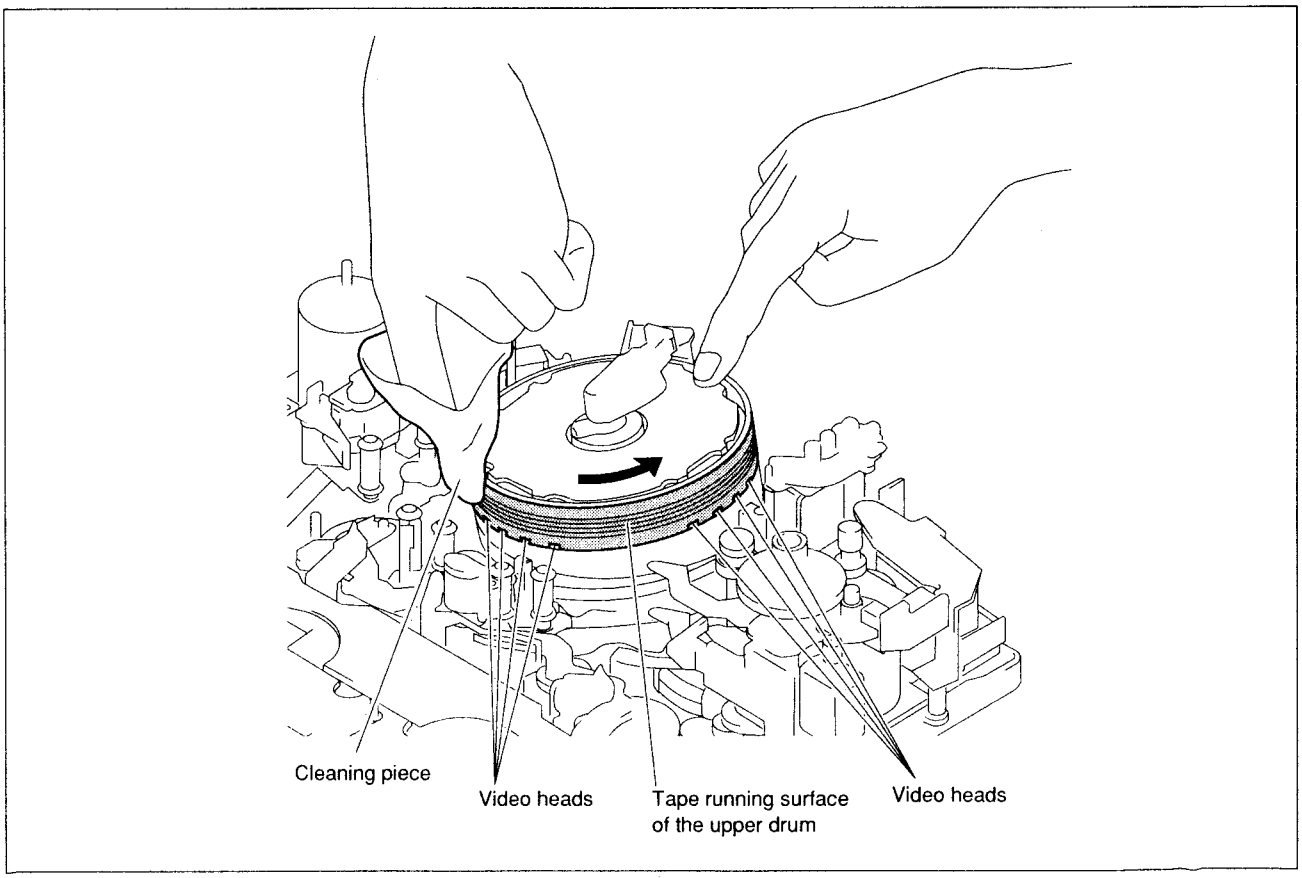
Procedures

1. Press a cleaning piece moistened with cleaning fluid slightly against the video heads, and rotate the upper drum slowly counterclockwise.
2. Press a cleaning piece moistened with cleaning fluid slightly against the tape running surface of the upper drum (shaded portion) as shown in the figure.

   Note

   Be sure to rotate the upper drum counterclockwise. Be sure to clean the rotary heads along the circumference. (Do not clean the video heads in the vertical direction. This may damage them.)

3. After cleaning, wipe the rotary heads using a dry cleaning piece.



5-1-3. Cleaning of Tape Running Surface of Lower Drum and Lead Surface

Notes

Take care not to damage the lower drum (specially lead surface) during cleaning. Take care to clean the edge portion above the lower drum because it is near the video heads.

Tools

- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01
- Skewer or an equivalent (A metallic skewer can not use.)

Procedures

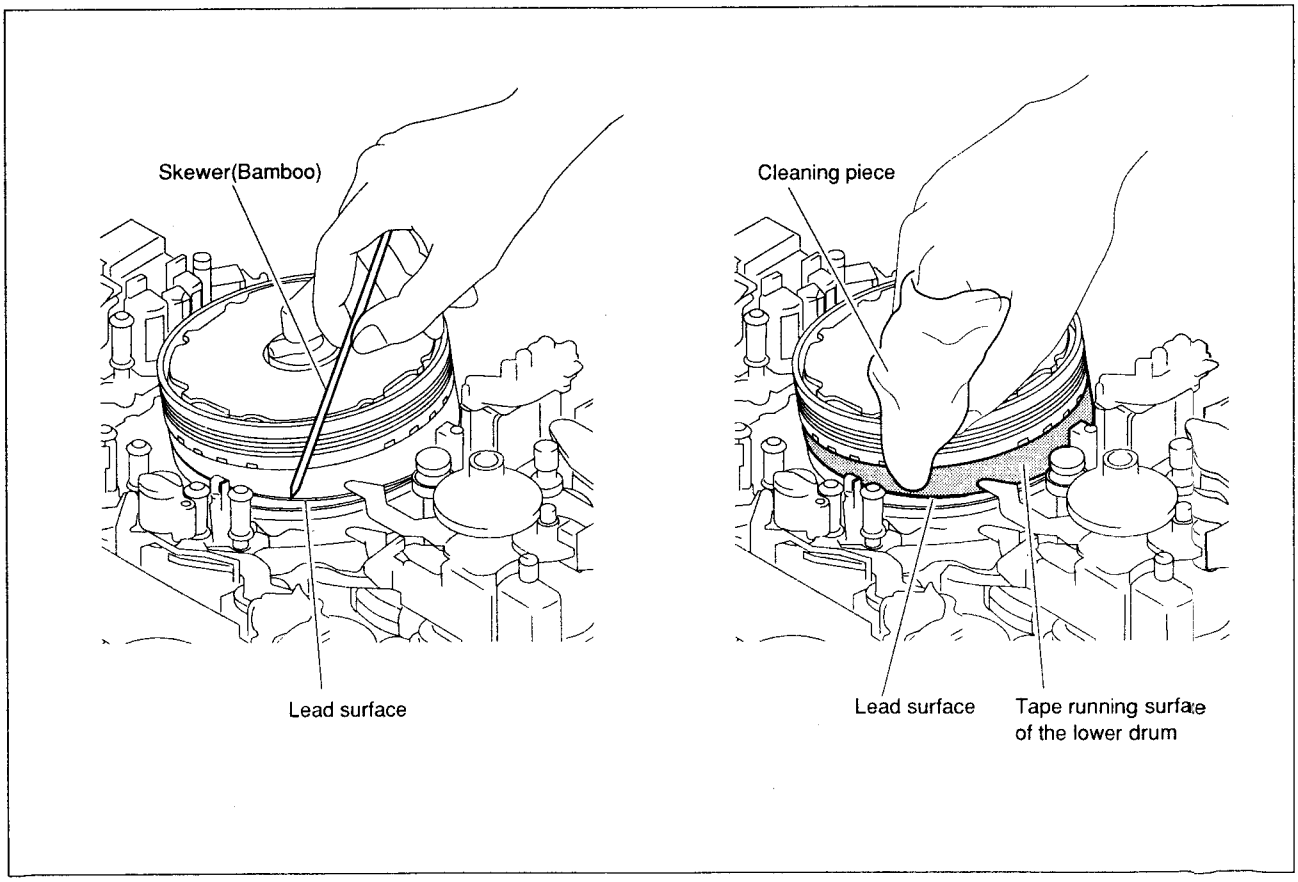
1. Put a skewer (or an equivalent) along the drum lead surface and remove magnetic powder as shown in the figure.

   Notes

   (a) Do not use a metallic skewer instead of a skewer. This may damage the tape running surface.
   (b) If the magnetic powder attached to the drum lead surface, tracking may badly influence. Remove the magnetic powder completely.

2. Clean the tape running surface of the lower drum and lead surface (shaded portion) using a cleaning piece moistened with cleaning fluid as shown in the figure.

3. After cleaning, be sure to wipe the tape running surface of the lower drum and lead surface using a dry cleaning piece.



5-1-4. Stationary Heads Cleaning

Note

Take care not to damage the surfaces of the stationary heads when cleaning.

Tools

- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

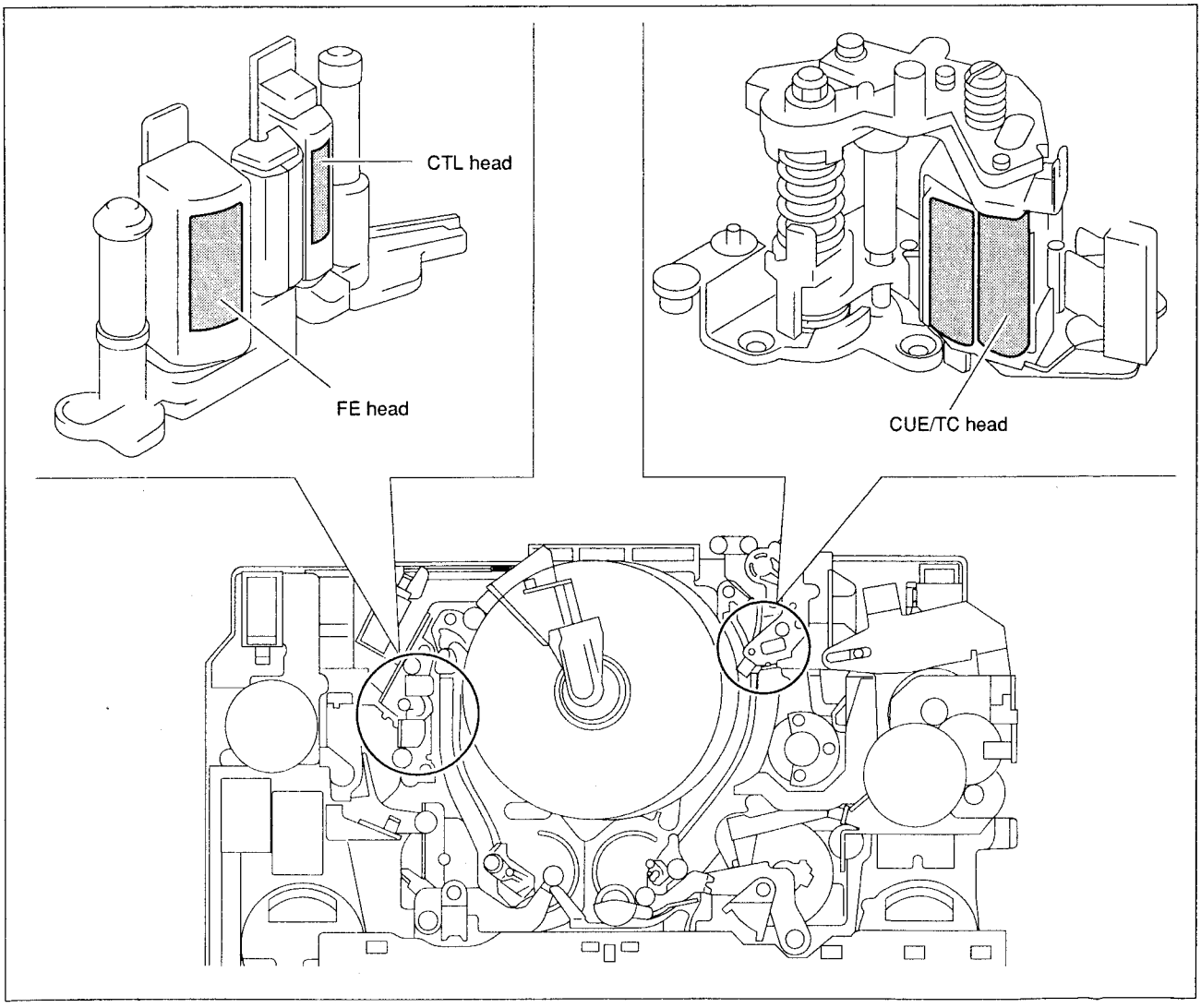
Procedures

1. Clean the tape running surfaces of the FE, CTL and CUE/TC heads in the vertical direction using a cleaning cloth moistened with cleaning fluid.

   Notes

   If the magnetic powder attached to the head gap portions of the FE, CTL and CUE/TC heads, an error may occur when the recording or playback. Remove the magnetic powder completely.

2. After cleaning, be sure to wipe the tape running surfaces of the FE, CTL and CUE/TC heads using a dry cleaning piece.



5-1-5. Cleaning of Tape Running System and Tape Cleaner

Notes

Tape cleaner has a sharp edge. Never touch the edge by bare hands. Take care to clean.

Tools

- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Procedures

1. Clean the tape running surfaces (shaded portions) of the following guides and the edge portion of the tape cleaner using a cleaning piece moistened with cleaning fluid as shown in the figure.

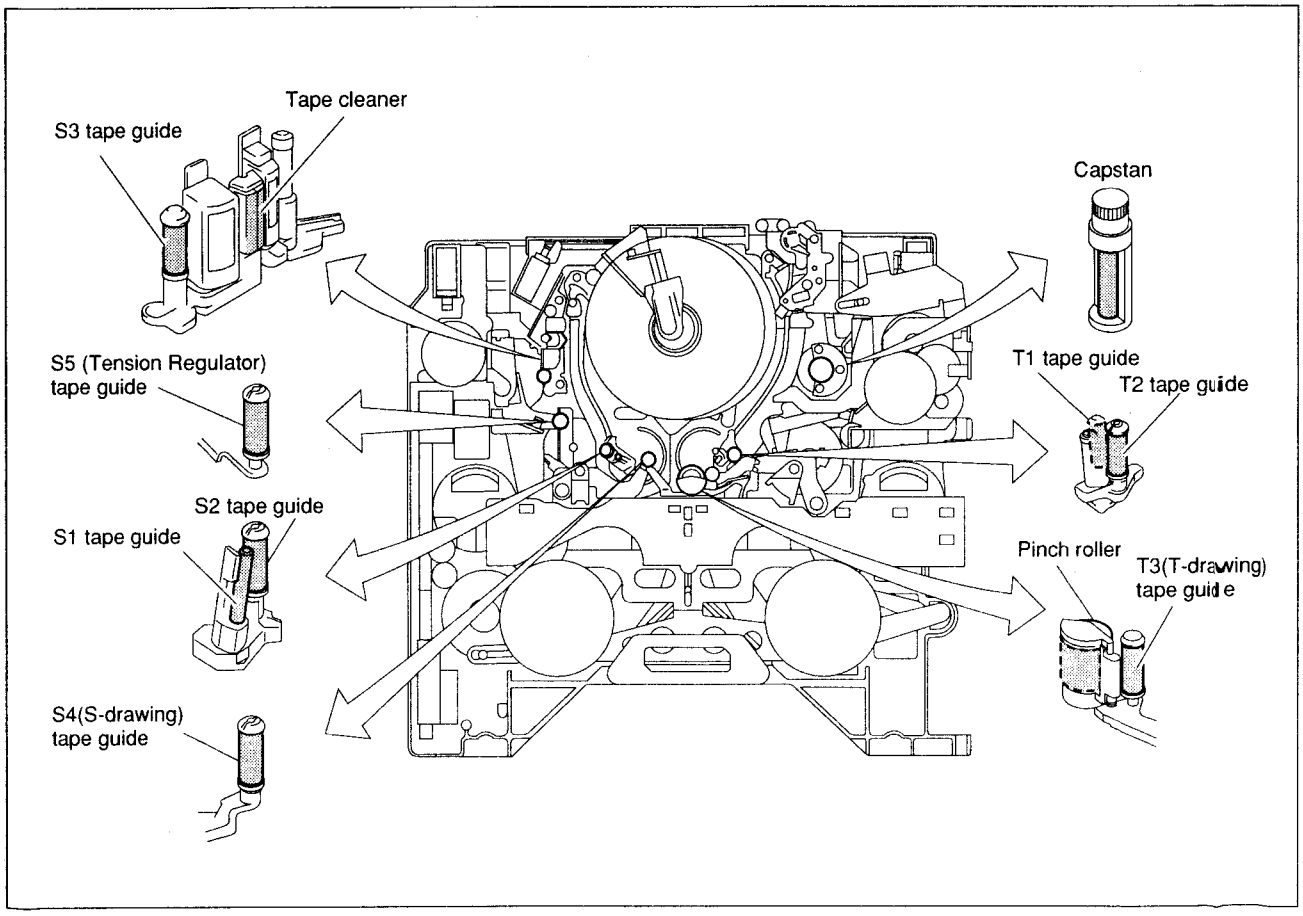
   S1 guide, S2 guide, S3 guide, S4 guide, S5 (tension regulator) guide, T1 guide, T2 guide, T3 guide, capstan and pinch roller

   CAUTION

   Never touch the edge portion of the tape cleaner by bare hands. It is danger of cutting your finger because the tape cleaner has a sharp edge.

2. Clean the gap of the tape cleaner that cloggs with the magnetic powder using a paper (or equivalent).

3. After cleaning, be sure to clean the tape running surfaces of the above guides and the edge portion of the tape cleaner using a dry cleaning piece.



5-2. Periodic Check

To make the most of the functions, fully realize performances of DVW-250/250P, and to lengthen the life of DVW-250/250P and tape, a periodic check is recommended.

5-2-1. Hours Meter

DVW-250/250P can display an hours meter on the LCD on the front panel.
It is recommendable to carry out the periodic check using this hours meter as a reference.

1. Display procedures

(1) Press the DIAG button on the front panel with a clip lead or similar object so that activate the DIAG menu.
(2) Align the asterisk cursor with the "HOURS METER" in the DIAG menu using the UP or DOWN button.
(3) Press the SET button so that diplay the "HOURS METER 1" menu.
(4) Press the SET button again so that diplay the "HOURS METER 2" menu.
(5) Press the DIAG button using the clip lead or similar object so that exit the DIAG menu.

2. Contents of display

```
HOURS METER 1

POWER ON
        000000H
DRUM ROTATE
        000000H
SET KEY --- NEXT
```

POWER ON : Accumulated power ON time.
DRUM ROTATE : Accumulated drum running hours.

```
HOURS METER 2

TAPE RUN
        000000H
TAPE THREAD
        000000TIMES
SET KEY --- EXIT
```

TAPE RUN : Accumulated tape running hours.
TAPE THREAD : Accumulated number of threading/unthreading cycle.

5-2-2. Periodic Check List

The replacement time which show in the following list are not the guarantee term parts. Use this list as guidelines for the maintenance and inspection. The replacement time of the parts vary depending on the operation environment and conditions of the unit.

Note

The parts marked with "↓" replace, and at the same time the part indicated by this arrow replaces.

DVW-250/250P Periodic Replacement List

No.	Item	Drum rotate (hours) 500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	Replacements parts Part name	Part No.
1	Upper drum	R	R	R	R	R	↓	R	R	R	R	R	↓	DJR-11-R (NTSC) DJR-12-R (PAL)	A-8269-263- A-8269-261-
2	Brush for slip ring	–	R	–	R	–	↓	–	R	–	R	–	↓	Brush assy (RP)	A-8263-856-
3	Slip ring	–	R	–	R	–	↓	–	R	–	R	–	↓	Slip ring assy (RP)	A-8263-855-
4	Drum	–	–	–	–	–	R	–	–	–	–	–	R	DJH-11A-R (NTSC) DJH-12A-R (PAL)	A-8269-262- A-8269-264-
5	Pinch roller	R	R	R	R	R	R	R	R	R	R	R	R	Pinch roller arm assy	X-3678-425-
6	Video head Cleaning roller	R	R	R	R	R	R	R	R	R	R	R	R	V cleaning roller assy	X-3167-281-
7	Cleaning brush for CUE head	R	R	R	R	R	R	R	R	R	R	R	R	CUE brush	3-681-778-
8	Capstan motor	–	–	–	–	–	R	–	–	–	–	–	R	DC motor SVC-0702A/J-N	8-835-534-
9	CTL head	–	–	–	–	–	R	–	–	–	–	–	R	CTL head PS244-21D	8-825-779-71
10	CUE/TC head	–	–	–	–	–	R	–	–	–	–	–	R	CUE/TC head EPS244-2103J	8-825-920-01
11	Reel belt (S/T)	R	R	R	R	R	R	R	R	R	R	R	R	Driving belt (2 pcs)	3-172-003-
12	Plunger solenoid (S/T brake)	–	–	–	–	–	R	–	–	–	–	–	R	Plunger solenoid	1-454-334-61
13	Plunger solenoid (V cleaner)	–	–	–	–	–	R	–	–	–	–	–	R	Plunger solenoid	1-454-607-21
14	Plunger solenoid (Pinch roller)	–	R	–	R	–	R	–	R	–	R	–	R	Pinch pressing plunger assy	A-8278-216-
15	S-TEN roller guide	–	R	–	R	–	R	–	R	–	R	–	R	S-TEN roller assy	X-3678-389-
16	S/T threading rail	Replacement every 10,000 times of threading												S rail T rail	3-691-360- 3-691-344-
17	Drawing arm (S/T)	Replacement every 10,000 times of threading												S arm assy T arm assy	A-8269-452- A-8278-218-
18	Intermittent gear	Replacement every 10,000 times of threading												Intermittent gear assy	X-3678-461-
19	Cam gear (S/T)	Replacement every 10,000 times of threading												Drawer arm gear Cam gear assy	3-679-777- X-3678-384-
20	Cassette compartment	Replacement every 10,000 times of threading												Cassette compartment assy (RP)	A-8269-732-
21	Threading motor	Replacement every 10,000 times of threading												Motor DN20-Q7Z1B	8-835-440-
22	T link	Replacement every 10,000 times of threading												T link assy	X-3678-423-
23	Catcher (S/T) and Slider (S/T)	Replacement every 10,000 times of threading												Brock assy, S drawer Brock assy, T drawer	A-8272-676- A-8272-677-
24	Lithum cell	Replacement every two years.												Super lithum cell	1-528-292-11

The "R" mark in this table indicates the time of the part replacement.

5-3. Cares after Using at Special Environment

It is recommended to check the following items after gathering the news at seaside or dust area.

1. Clean off sand and other dust in the unit carefully.
2. Clean the video heads, upper and lower drums and stationary heads.
3. Clean the tape running surfaces (tape guides, capstan shaft and pinch roller).
4. Clean the connectors on the connector panel.
5. Carry out the common operation check (recording or playback) and check that the unit has not an abnormal sound or operation.

If the unit has an abnormal condition, please contact your Sony service organization.

Section 6
Replacement of Mechanical Parts

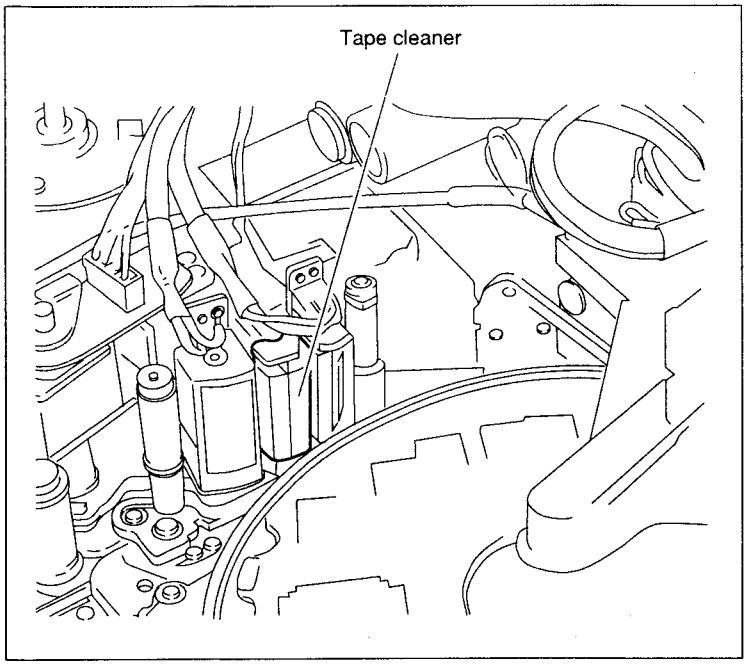
6-1. General Information for Mechanical Part Replacement

6-1-1. Caution

1. Tape cleaner

Note

Never touch the tape cleaner installed at the entrance head assembly with bare hands. It is danger of cutting your finger because the tape cleaner has a sharp edge.



2. Tool

- Before using a tool be sure to clean its surface.
- Cleaning piece : 2-034-697-00
- Cleaning fluid: 9-919-573-01
- Pay careful attention to do not damage the tool.
  If the tool is damaged, the adjustment can not correctly carry out.

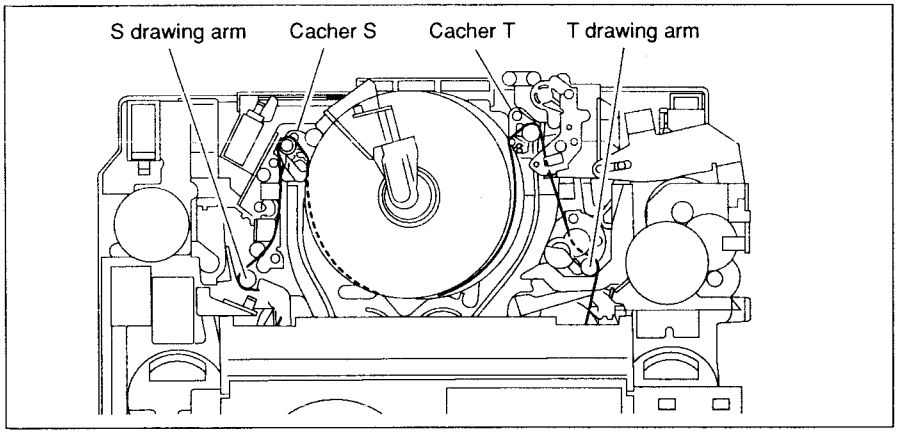
6-1-2. Threading End/ Unthreading End Mode

1. Threading end mode

Threading end mode means that the S and T sliders move from around the reel tables to both sides of the drum, and stop at the cut portions like a V of the catchers S and T. And the S drawing arm and T dawing arm are fixed at the portion that shown in folloing figure.

(1) To enter the threading end mode with a tape

- Insert a cassette tape into the cassette compartment.
- Close the front lid.

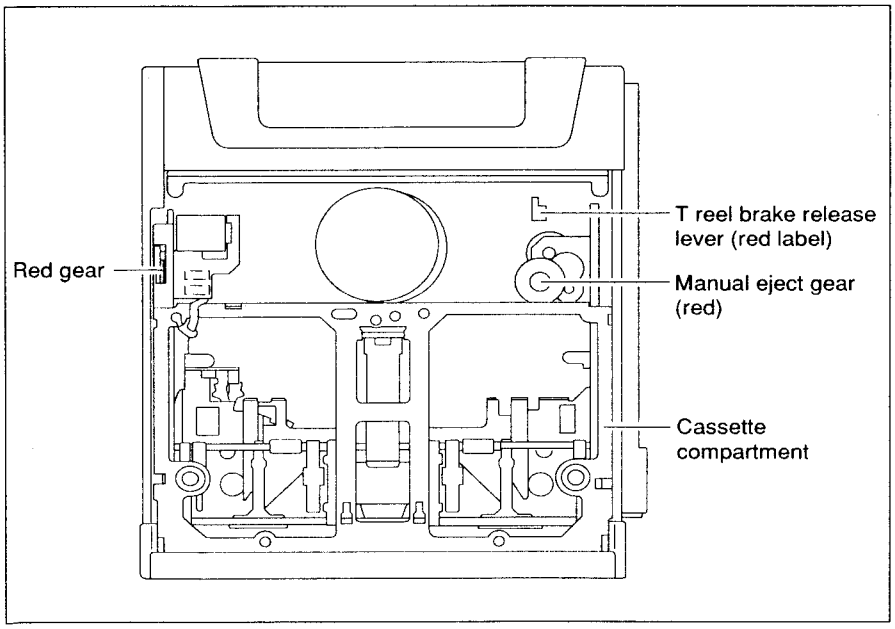


(2) To enter the threading end mode without a tape

Note

When no cassette is in the cassette compartment, do not turn the red gear on the left of the cassette compartment.

- Turn the power off.
- Remove the top panel.
- During pushing the T reel release lever, turn the manual eject gear clockwise as far as it will go while pushing it downward.



2. Unthreading end mode

Unthreading end mode means that the S and T sliders move from the catchers S and T to the directions of the reel tables, and then stop. This mode is the same as the eject completion mode.

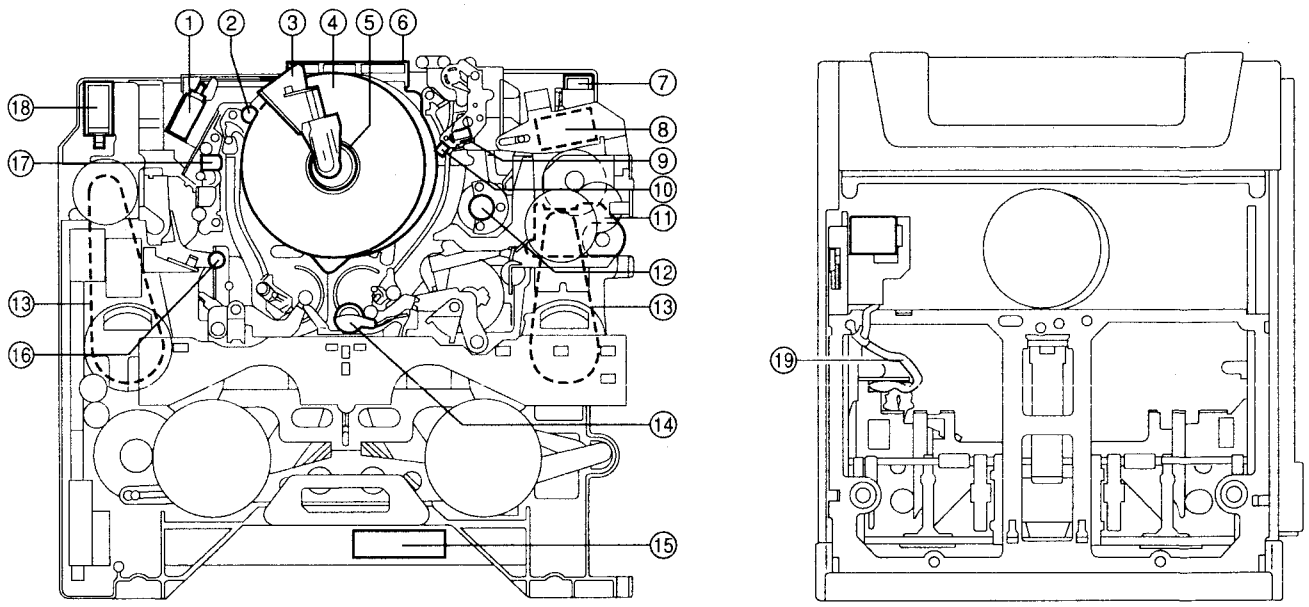
(1) To enter the unthreading end mode
- Press the EJECT button.

(2) To enter the unthreading end mode manually
- Turn the power off.
- While keep pushing the brake release lever toward you, and turn the manual eject gear counterclockwise as far as it will go while pushing it downward.
- Turn the red gear on the left of the cassette compartment toward the battery case and put the cassette compartment into the up state.

Note

When no cassette is in the cassette compartment, do not turn the red gear.

6-1-3. Parts Location of Periodical Replacement Parts



Mark	Item	Title
1	Video head cleaner solenoid	6-14. Video Head Cleaner Solenoid Replacement
2	Video head cleaning roller	6-8. Video Head Cleaning Roller Replacement
3	Brush	6-2. Brush Replacement
4	Upper drum	6-4. Upper Drum Assembly Replacement
5	Slip ring	6-3. Slip Ring Assembly Replacement
6	Drum assembly	6-5. Drum Assembly Replacement
7	T reel brake solenoid	6-13. T Reel Brake Solenoid Replacement
8	Pinch solenoid	6-10. Pinch Solenoid Assembly Replacement
9	CUE/TC head	6-17. Audio/TC Head Replacement
10	CUE brush	6-9. Cue Brush Replacement
11	Gear block	6-18. Threading Motor Replacement
12	Capstan motor	6-15. Capstan Motor Replacement
13	Driving belt	6-6. Driving Belt Replacement
14	Pinch roller arm assembly	6-7. Pinch Roller Arm Assembly Replacement
15	Battery	6-19. Battery Replacement
16	Tension regulator roller	6-11. Tension Regulator Roller Replacement
17	CTL head	6-16. CTL Head Replacement
18	S reel brake solenoid	6-12. S Reel Brake Solenoid Replacement
19	Cassette compartment herness	6-20. Cassette Compartment Harness Replacement

6-1-4. Other Cautions

(1) Screwdrivers and screw tightening torque

This unit uses small in size of screws. Be sure to use the relevant tools when loosening or tightening these screws. Be sure to use the torque screwdriver when tightening the screw, and tighten in the relevant torque reading.

Torque screwdriver bit (for M1.4): J-6325-110-A
Torque screwdriver bit (for M2) : J-6325-380-A
Hexagon bit (across 1.5 mm) : J-6326-120-A
Hexagon bit (across 1.27 mm) : J-7031-460-A
Torque screwdriver (for 3 kg) : J-6325-400-A

Tightening torque

For M1.4(+) screw: 9×10^{-2} N•m (0.9 kgf•cm)
For M2(+) screw : 19×10^{-2} N•m (1.9 kgf•cm)
For hexagon screw: 19×10^{-2} N•m (1.9 kgf•cm)

Note

This unit uses the small in size of screws. When removing or attaching, the screw may fall in the unit. To prevent this, it is recommended to magnetize the screwdriver bit.

(2) Stop washers

Never re-use the pre-used stop washers. When attaching the part, be sure to use a new stop washer.

Stop washer: 3-321-393-01
Stop washer: 3-669-465-01
Stop washer: 3-726-829-01

- Stop washer removal

  (1) Remove the stop washer using a pair of tweezers or a small flatblade screw driver.

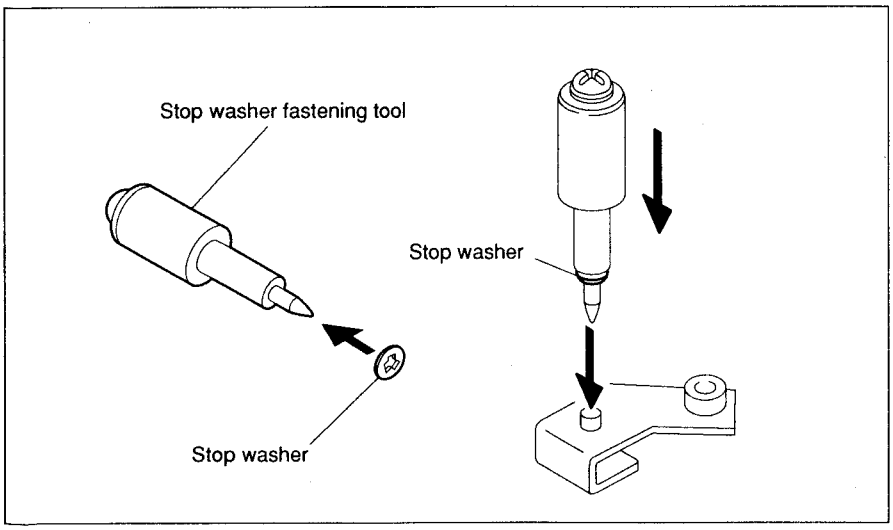
Notes

- Be careful not to fall the stop washer in the unit.
- Take care not to touch the tool against the other parts (especially the drum).
- Stop washer installation

  When attaching, it is recommended to use the following tool.

  Stop washer fastening tool: J-6323-530-A

  (a) Put a stop washer to the top of a stop washer fastening tool.
  (b) Put the top of the tool on the top of the shaft in an upright position.
  (c) Press down the tool and attach the stop washer to the shaft.

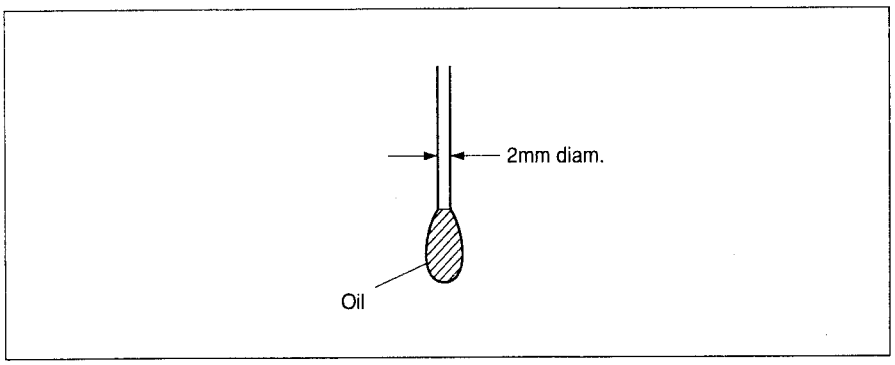


(3) Oil and grease

Be sure to use the relevant oil and grease. If the different oil or grease used, major malfunction may cause due to the differences in viscosity and ingredients. If the oil and grease used which mixed with dust, major malfunction may cause. Be sure to use the following oil and grease.

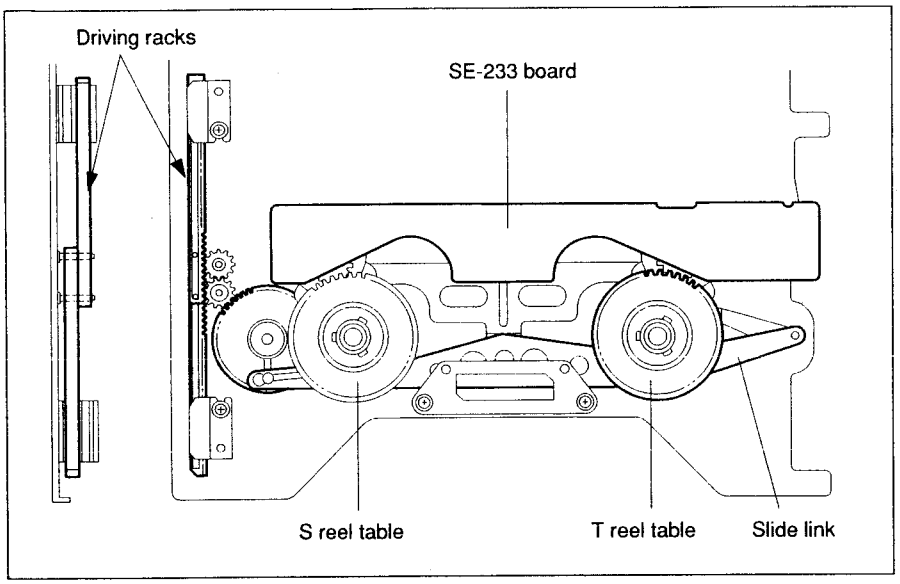
Oil : 7-661-018-18
Grease (SGL-601): 7-651-000-10
Grease (SGL-801): 7-651-000-11

- A drop of oil defines as follows; About the amount will adhere to the end of a stick (2 mm in diameter) as shown in the figure.
- Smear grease onto the surface of the park like a thin film.
- Apart from the relevant areas never use the oil and grease. If grease smeared apart from the relevant areas, be sure to wipe using a gauze or soft cloth.

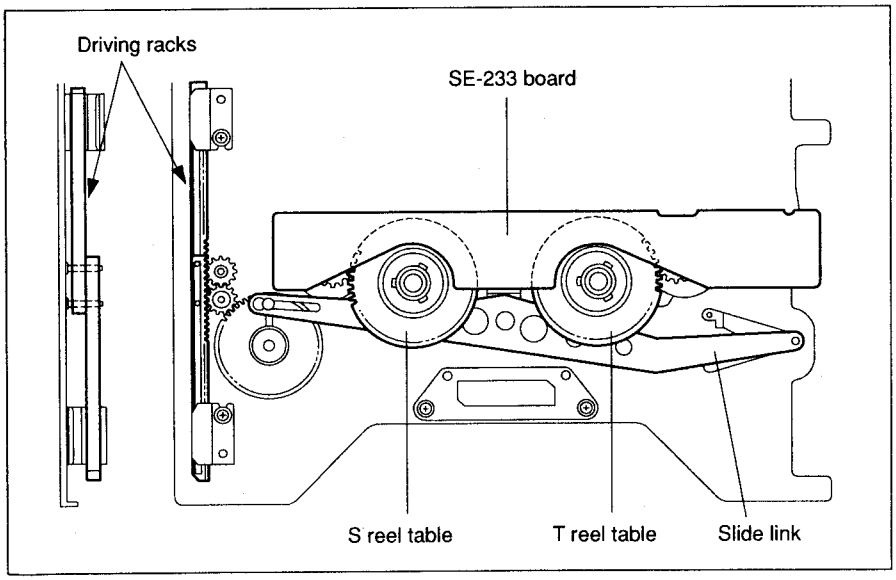


6-1-5. Reel Table Position

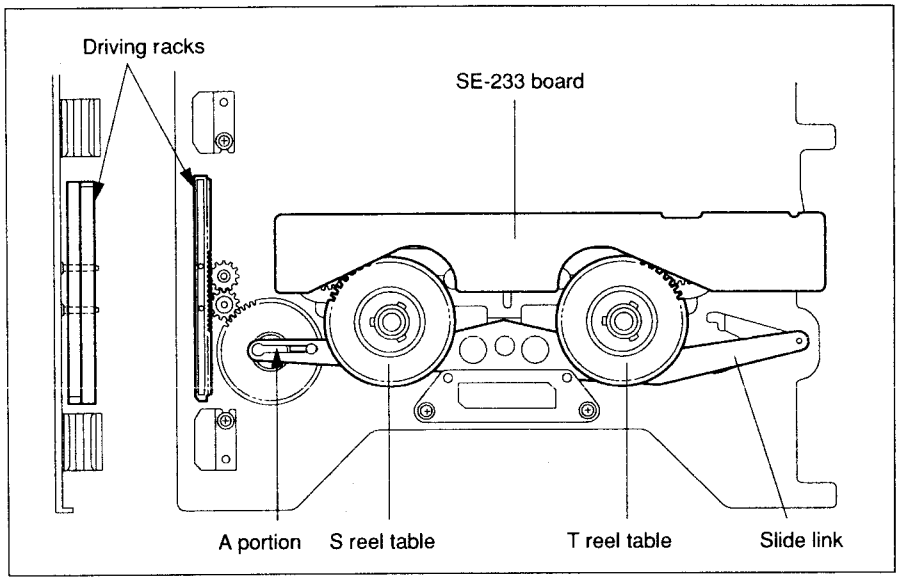
1. L cassette position:
   It means that the Reel Tables are in the positiono of L cassette.



2. S cassette position:
   It means that the Reel Tables are in the positiono of S cassette.



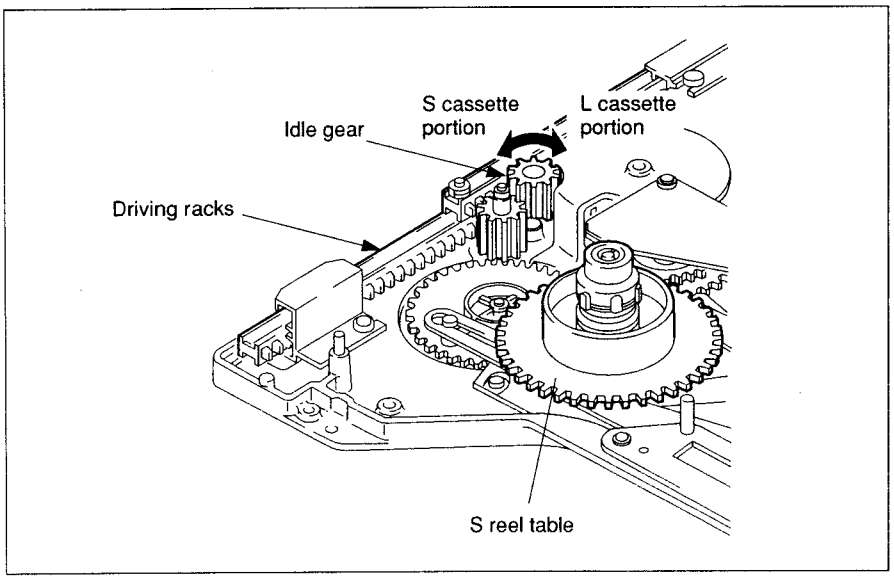
3. Intermediate position between L and S cassette position:
   It means that positions of two Driving Racks are the same place, and A portion of the Slide Link parallels to the unit. (Refer to the below figure.)



How to put the unit into the L cassette position, S cassette position and intermediate position between L and S cassette positions:
Turn an Idle Gear as shown in the figure until the Reel Table Assemblies shift to the desired position and Driving Rack lock.

Note

If a cassette tape is inserted, the Reel Tables can not be Shifted.



6-2. Brush Replacement

Overviews

Brush cover removal
Brush assembly removal
Brush assembly installation
Brush cover installation

Cautions

If the brush worn out, replace the brush assembly. Once the brush assembly is installed referring to the following procedures, the relative height and the contact pressure against the slip ring will be automatically adjusted. Therefore, the adjustment after replacement is not required.
Never clean on the surface of the brush using a cleaning piece moistened with cleaning fluid.

Preparations

1. Turn off the power.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

Note

The brush assembly can replace when the cassette compartment attaches to the unit.

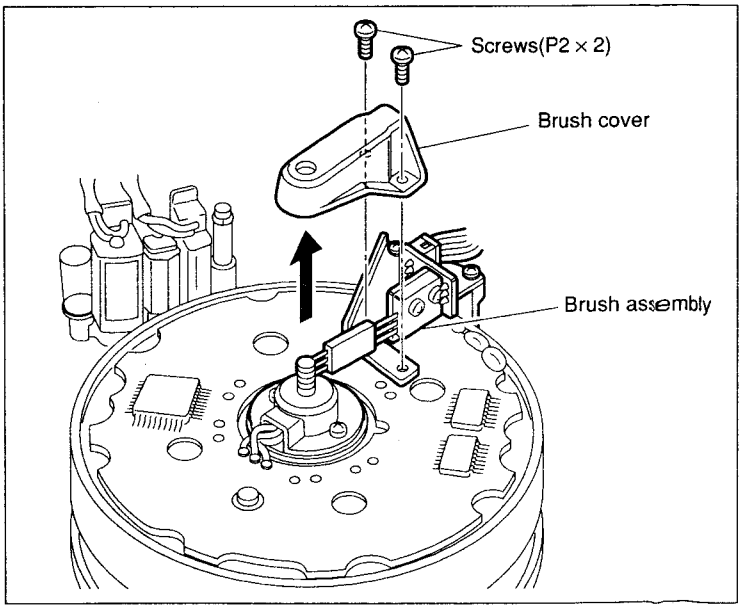
Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

Removal

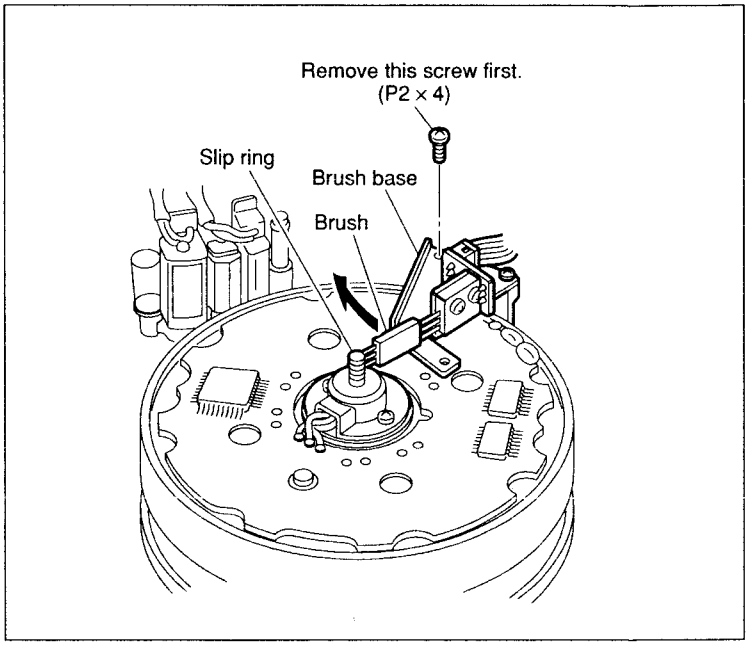
1. Brush cover removal

(1) Remove the two screws and the brush cover.



2. Brush assembly removal

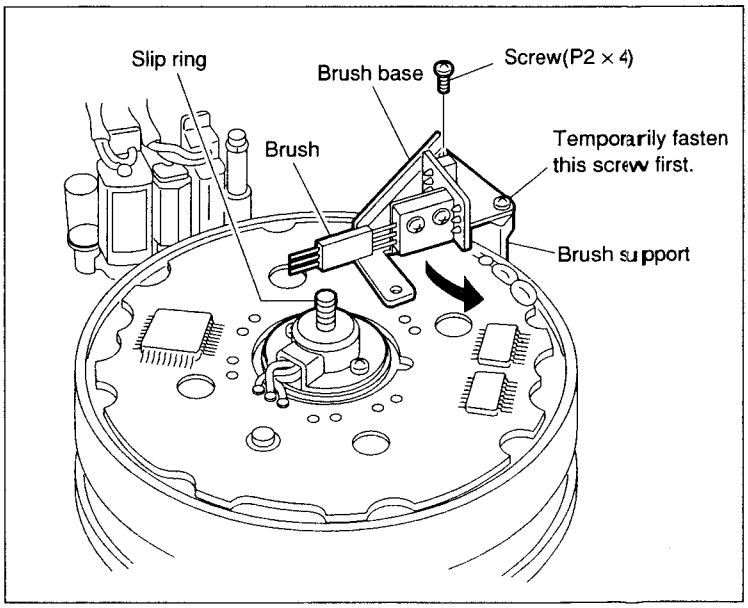
(1) Disconnect the connector CN913 on the MB-601 board.
(2) Remove one of the screws, shown in the figure, which secures the brush base.
(3) Loosen the other screw and move the brush base in the direction of the arrow.
In this way, the brush and slip ring will release.
(4) Remove the screw and the brush assembly.
(5) Disconnect the connector on the brush board.



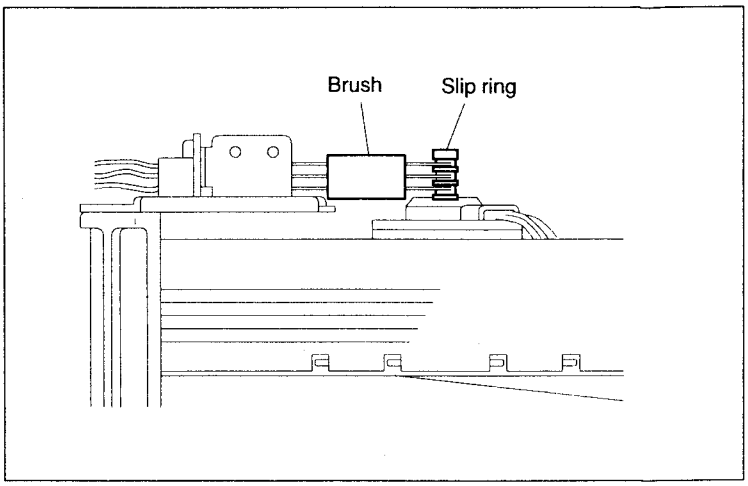
Installation

3. Brush assembly installation

(1) Connect the connector to the brush board.
(2) Temporarily attach the brush assembly to the brush support with the screw shown in the figure.
Note
Never touch the brush.
(3) Move the brush base while pressing down the brush base above the brush support and temporarily attach the brush assembly using the other screw.
(4) Tighten the screws in steps (2) and (3).



(5) Check that the brush correctly touches against the slip ring.
Reference
Once steps (2) to (4) completed, the height of the brush and contact pressure against the slip ring will automatically adjust.
(6) Connect the connector CN913 on the MB-601 board.



4. Brush cover installation

Align the hole of the brush cover with the shaft of the slip ring, and tighten the brush cover with two screws.

6-3. Slip Ring Assembly Replacement

Overviews

Brush cover removal
Brush assembly removal
Slip ring assembly removal
Slip ring assembly installation
Brush assembly installation
Brush cover installation

Cautions

If the slip ring worn out, replace the slip ring assembly. Once the slip ring assembly replaced, the adjustment is not required.
Never clean on the surface of the slip ring assembly using a cleaning piece moistened with cleaning fluid.

Preparations

1. Turn off the power.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

Note

The brush assembly can replace when the cassette compartment attaches to the unit.

Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

Removal

1. Brush cover removal

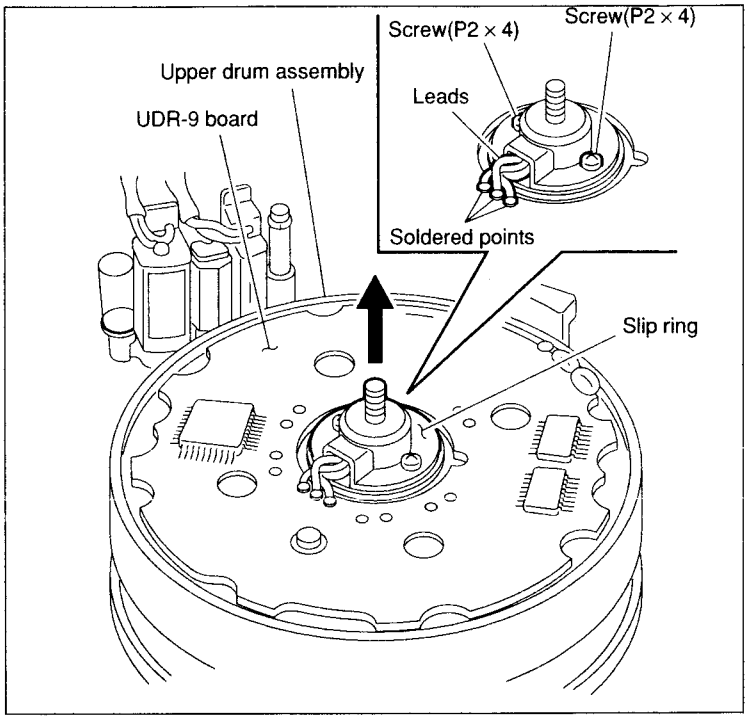
Remove the brush cover. (Refer to "6-2. Brush Replacement".)

2. Brush assembly removal

Remove the brush assembly. (Refer to "6-2. Brush Replacement".)

3. Slip ring assembly removal

(1) Unsolder the three leads of the slip ring assembly from the UDR-9 board on the upper drum assembly.
(2) Remove the two screws and the slip ring assembly.



Installation

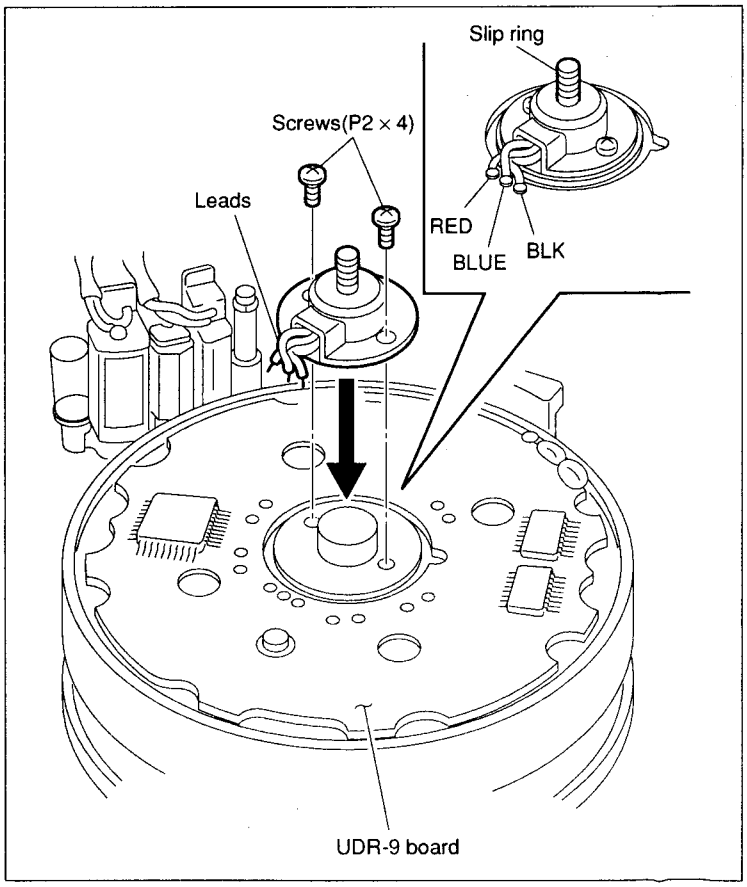
4. Slip ring assembly installation

(1) Attach the slip ring assembly to the drum shaft so that the three leads of the slip ring assembly are positioned to the printed silk (RED, BLUE, and BLK) on the UDR-9 board of the upper drum assembly.

Note

Hold the black portion of the slip ring assembly during installation. Never touch the slip ring.

(2) Attach the slip ring assembly using the two screws.
Tightening torque: 19×10^{-2} N•m (1.9 kgf•cm)
(3) Solder the three leads of the slip ring assembly to the UDR-9 board of the upper drum assembly.
Red lead : RED pattern
Blue lead : BLUE pattern
Black lead: BLK pattern



5. Brush assembly installation

Install the brush assembly. (Refer to "6-2. Brush Replacement".)

6. Brush cover installation

Install the brush cover. (Refer to "6-2. Brush Replacement".)

6-4. Upper Drum Assembly Replacement

Overviews

Replacement

Brush cover removal
Brush assembly removal
Unsoldering the leads of slip ring assembly
Upper drum assembly removal
Cleaning of contact surfaces
Upper drum assembly installation
Upper drum eccentricity gauge installation
Upper drum eccentricity adjustment
Upper drum eccentricity gauge removal
Solder the leads of slip ring assembly
Brush assembly installation
Brush cover installation
Cleaning of video heads and tape running surfaces

Adjustment after replacement

Tape path adjustment

Note

If the rotary heads worn out or broke, replace the upper drum assembly. The head chip cannot replace.

Basic information

Apart from the periodic replacement time, the upper drum assembly needs to replace in the following case.

- If a correct RF waveform cannot be obtained after the tracking adjustment is performed

Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the cassette compartment. (Refer to Section 1-6.)

Tools

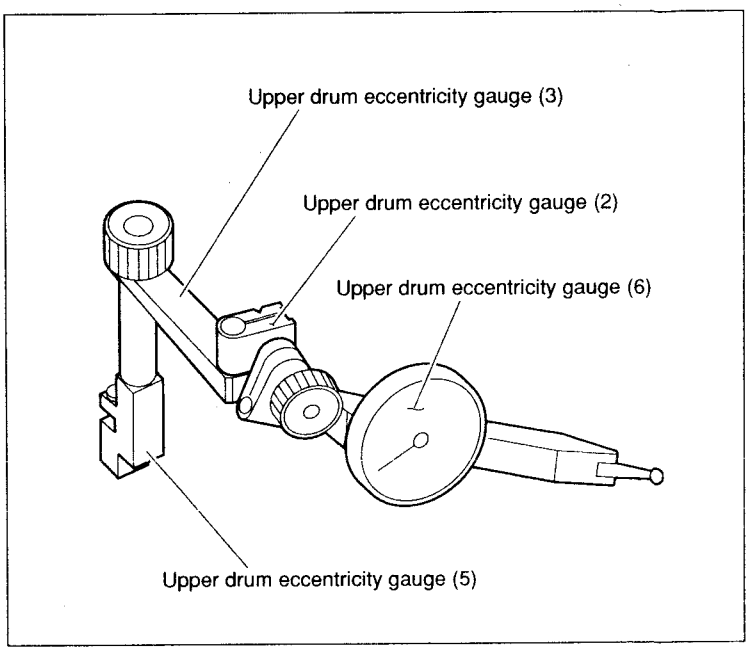
- Torque screwdriver bit (for M2): J-6325-380-A
- Hexagon bit (across 1.5 mm) : J-6326-120-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Upper drum eccentricity gauge (3) : J-6001-820-A
- Upper drum eccentricity gauge (2) : J-6001-830-A
- Upper drum eccentricity gauge (5) : J-6087-000-A
- Upper drum eccentricity gauge (6) : J-6325-530-A
- L wrench (across 1.5 mm) : 7-700-736-05
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Notes

(1) When the upper drum assembly attaches to the flange, tighten the screws to the following tightening torque.
- First : 9.8×10^{-2} N•m (1 kgf•cm).
- Second: 24.5×10^{-2} N•m (2.5 kgf•cm).

To tighten the screws to the above tightening torque, set the torque to 9.8×10^{-2} N•m (1 kgf•cm) after attaching the hexagon bit to the torque screwdriver.

(2) Assemble the upper drum eccentricity gauges as shown in the figure before use.


Upper drum eccentricity gauge (3)
Upper drum eccentricity gauge (2)
Upper drum eccentricity gauge (6)
Upper drum eccentricity gauge (5)

Removal

1. Brush cover Removal

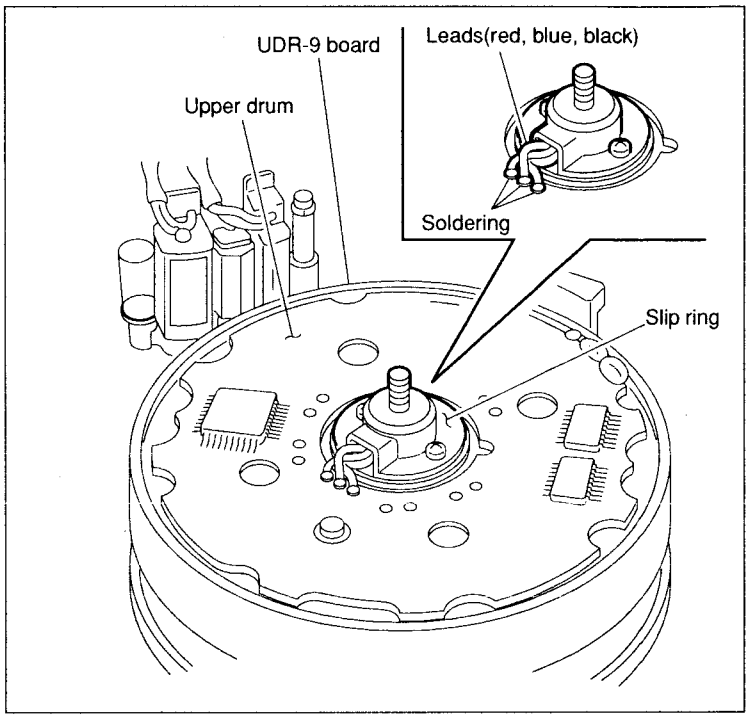
Remove the brush cover. (Refer to "6-2. Brush Replacement".)

2. Brush assembly removal

Remove the brush assembly. (Refer to "6-2. Brush Replacement".)

3. Unsoldering the leads of slip ring assembly

Unsolder the three leads of the slip ring assembly from the UDR-9 board on the upper drum assembly.



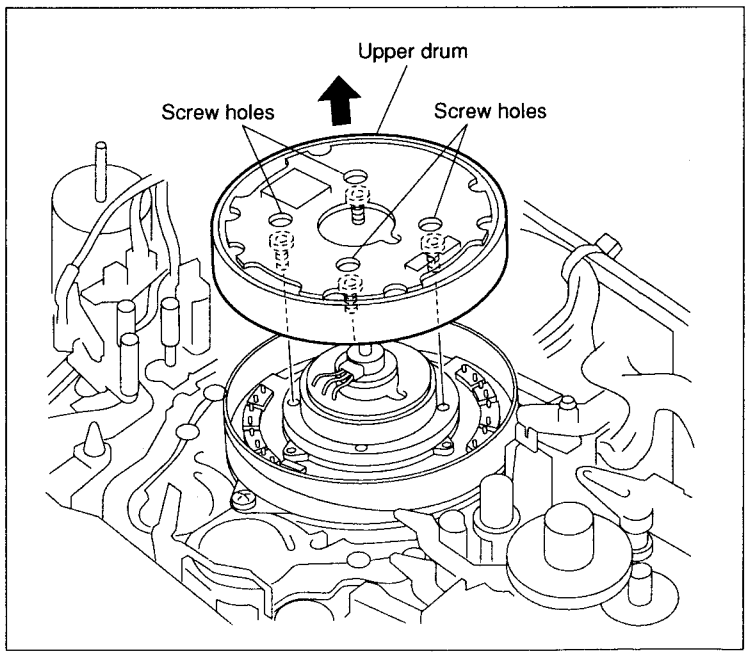
4. Upper drum assembly removal

(1) Put an L wrench into the holes of the upper drum assembly and remove the four screws.

(2) Lift just above and remove the upper drum assembly.

Notes

- Be careful not to damage the upper edge of the lower drum after the upper drum assembly is removed.
- Remove the screws from the removed upper drum assembly using a pair of tweezers.



Installation

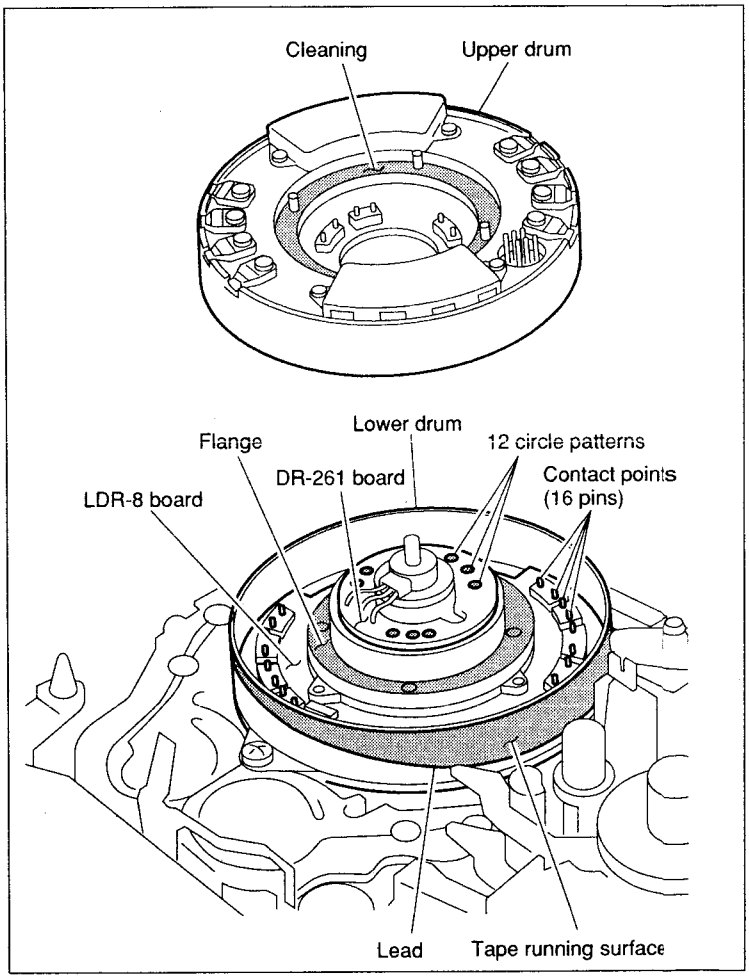
5. Cleaning of contact surfaces

(1) Clean the following places using a cleaning cloth moistened with cleaning fluid.
- Flange of the lower drum (Shaded portion)
- Tape running surface and lead of the lower drum
- Contact surface of a new upper drum assembly (Shaded portion)

(2) Wipe the 8 contact points (16 pins) mounted on the LDR-8 board of the flange and 12 circle patterns on the DR-261 board using a dry cleaning cloth.

Note

Never clean using a cleaning cloth moistened with cleaning fluid.



6. Upper drum assembly installation

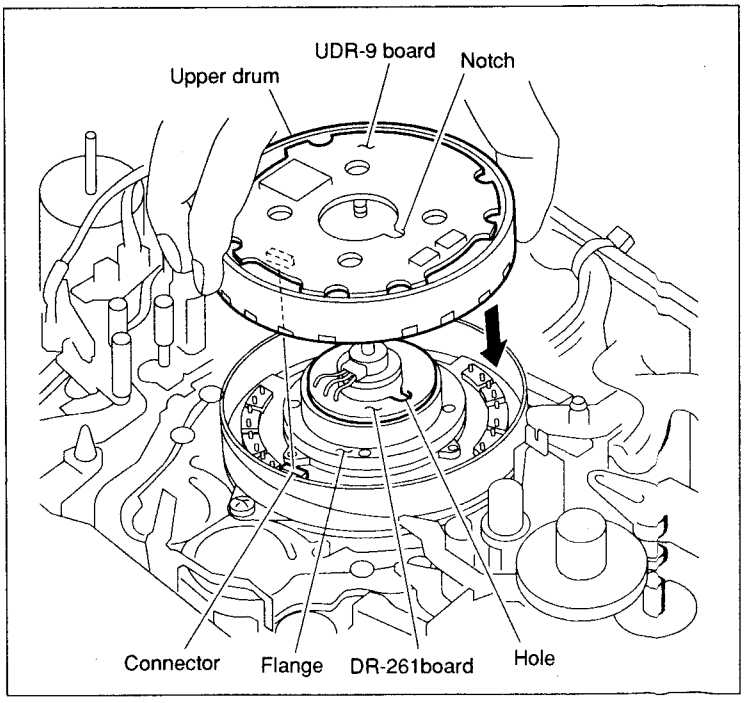
(1) Hold the no video head portions of a new upper drum assembly. Align the notch of the center hole on the UDR-9 board with the hole on the DR-261 board.

(2) Move the upper drum assembly in the direction of the flange without tilting it slowly and connect a 6-pin connector plug to the connector on the LDR-8 board of the flange.

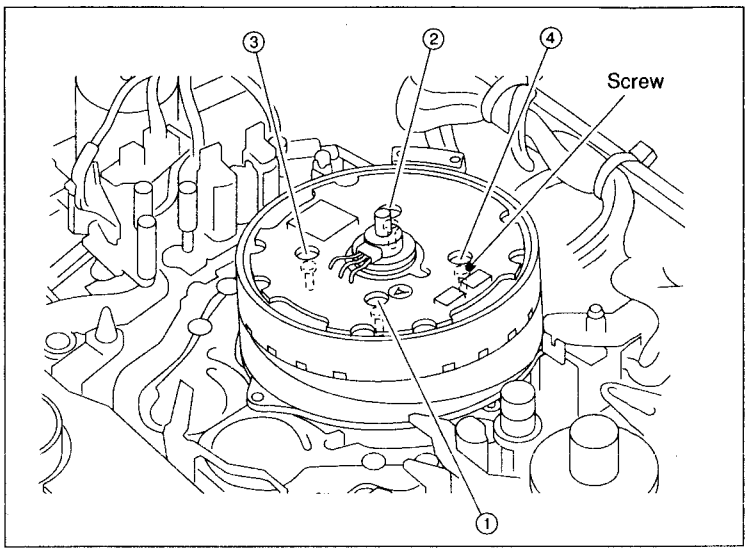
Note

Take care not to touch the video heads against the brush support or peripheral parts when installing the upper drum assembly.

(3) Press the upper drum assembly in the direction of the flange until it securely attached.



(4) Put the four screws (removed in step 4) in the four holes on the board of the upper drum assembly using a pair of tweezers.
(5) Using an L wrench thread the four screws tentatively in the sequence shown in the figure. Do not tighten them.



7. Upper drum eccentricity gauge installation

(1) Clean the probe of the gauge with a cleaning cloth moistened with cleaning fluid.

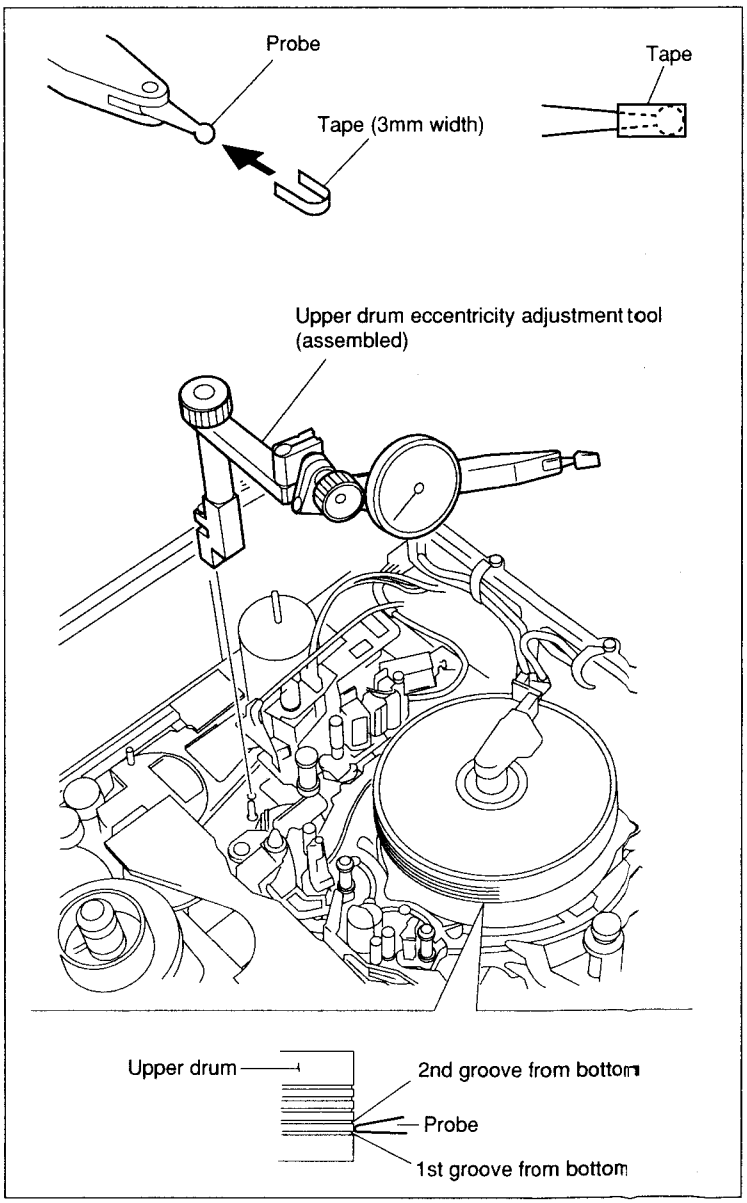
Notes

- If the prove were dirty, upper drum may scratch during adjustment.
- If the prove were made of metal, it recommends that the lubricated protective tape puts on the prove to prevent from the scratching.

(2) Attach the gauge shown in the figure and adjust so that the probe is positioned between the bottom two grooves of the five which locate on the outside of the upper drum assembly.

Note

Take care not to touch the probe against the video heads.



8. Upper drum eccentricity adjustment

(1) Slowly turn the upper drum assembly counterclockwise for one turn and check that the indicated deflection of the gauge meets the following specification.
Specification: Within 3 μm
If the specification is not met, repeat the following three steps and adjust until the specification is met.
   (a) Slowly turn the upper drum assembly counterclockwise and check the maximum and minimum values of the indicated deflections.
   (b) Turn the upper drum assembly until the minimum deflection value indicates.
   (c) Push the upper drum assembly in the position opposite to the measuring probe by 180 degrees toward the direction of the arrow so that the pointer deviation is 1/2 between the maximum and minimum values.

Note

If the indicated deflection did not move when pressing the upper drum assembly by finger, loosen the four screws that secure the upper drum assembly. If the indicated deflection easily moved when pressing, tighten the screws a little.

(2) Set the torque screwdriver to 9.8×10^{-2} N•m (1 kgf•cm). Put the torque screwdriver in the four holes on the board of the upper drum assembly. Tighten the four screws in the sequence shown in the figure.

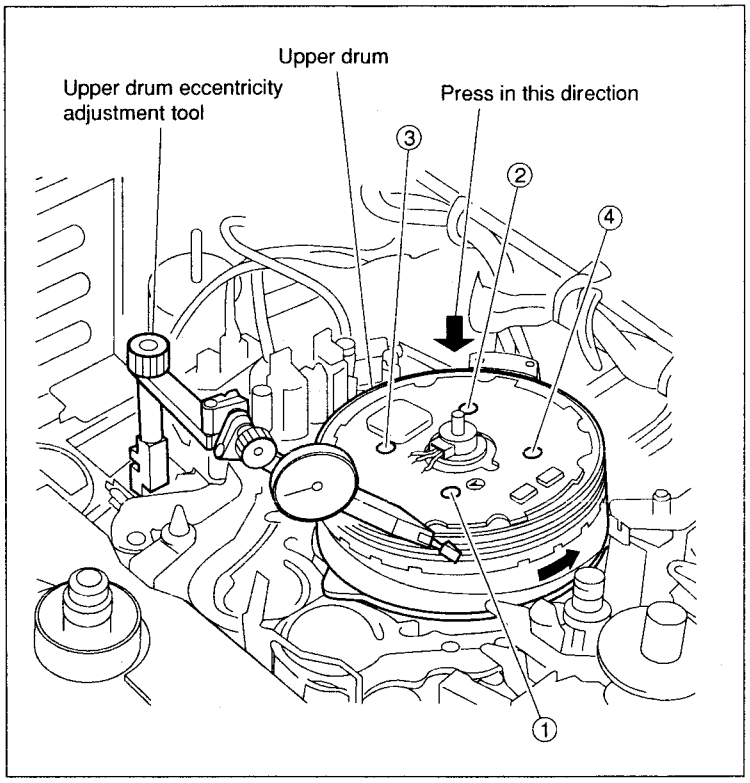
Note

When tightening the screw just after eccentricity adjustment, be sure to tighten them to 9.8×10^{-2} N•m (1 kgf•cm).

(3) Set the torque screwdriver to 24.5×10^{-2} N•m (2.5 kgf•cm).

(4) Tighten the four screws in the same sequence as in step (2) using a torque screwdriver.

(5) Re-check that the specification is met.



9. Upper drum eccentricity gauge removal

Remove the upper drum eccentricity gauge.

10. Solder the leads of slip ring assembly

Solder the three leads of the slip ring assembly. (Refer to "6-3. Slip Ring Assembly Replacement".)

11. Brush assembly installation

Install the brush assembly. (Refer to "6-2. Brush Replacement".)

12. Brush cover installation

Install the brush cover. (Refer to "6-2. Brush Replacement".)

13. Cleaning of video heads and tape running surfaces

Clean the following area using a cleaning cloth moistened with cleaning fluid.

- Video heads (Refer to "5-1. Cleaning".)
- Tape running surface of the upper drum (Refer to "5-1. Cleaning".)
- Tape running surface and lead of the lower drum (Refer to "5-1. Cleaning".)

Note

After cleaning, be sure to wipe the relevant area using a dry cleaning cloth.

Adjustments after replacement

14. Tape path adjustment (Refer to Section 7-1-1.)

6-5. Drum Assembly Replacement

Overviews

Replacement

Video head cleaner assembly removal
Drum assembly removal
Cleaning of contact surfaces
Drum assembly installation
Video head cleaner assembly installation
Cleaning of video heads and tape running surfaces

Adjustment after replacement

Video head cleaner assembly position adjustment
Tape path adjustment
Servo adjustment
Video adjustment

Caution

When replacing the drum assembly be careful not to damage the CTL head, CUE/TC head, and peripheral tape guide.
Be careful not to break the video heads of the drum assembly.

Basic information

Apart from the periodic replacement time, the drum assembly needs to replace in the following cases.

- If the drum assembly could not use because the tape running surface of the upper or lower drum scratched.
- If a correct RF waveform did not obtain after the tracking adjustment due to wear-out on the upper or lower drum.
- If the specification of the VTR such as jitter or noise did not meet due to the short life of the bearing.

Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the cassette compartment. (Refer to Section 1-6.)

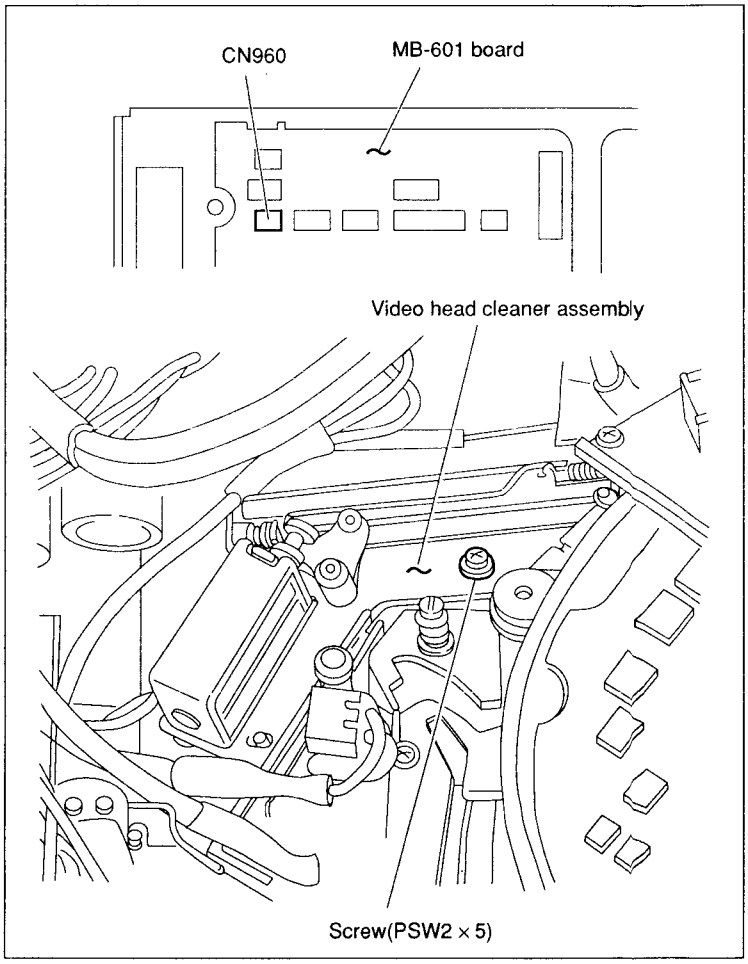
Tools

- Torque screwdriver bit (for B2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

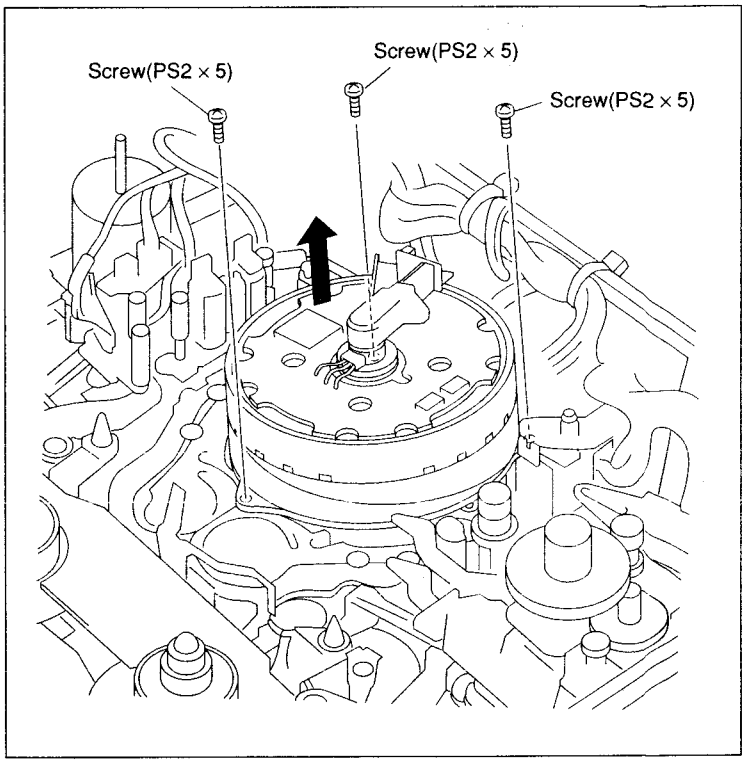
1. Video head cleaner assembly removal

(1) Put the unit into the unthreading end mode.
(2) Disconnect connector CN960 (video head cleaner solenoid) on the MB-601 board.
(3) Remove one screw, then remove the video head cleaner assembly.



2. Drum assembly removal

(1) Remove the three screws which secure the drum assembly.

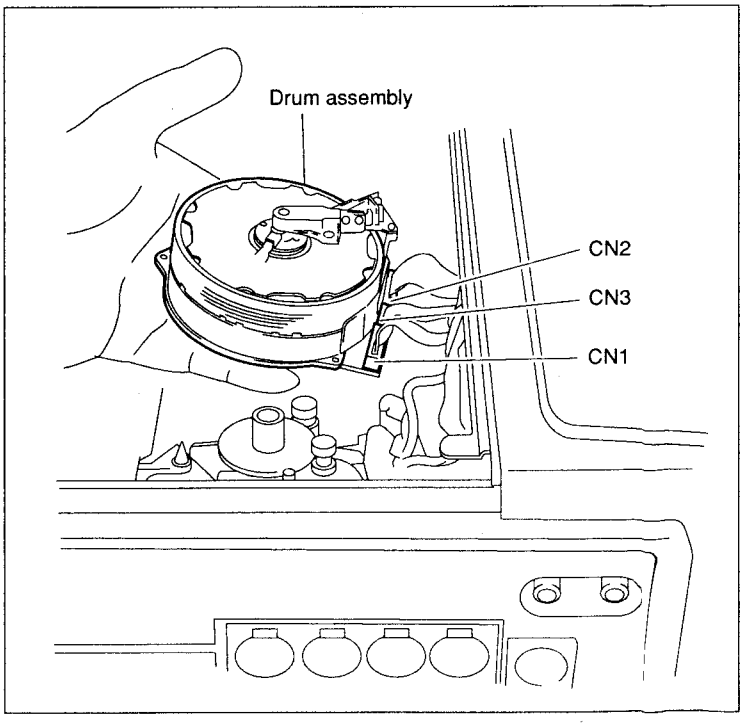


(2) Lift just above the drum assembly and disconnect the connector connected to the brush board.

(3) Disconnect the three connectors (CN1, CN2, and CN3) connected to the board at the bottom of the drum.
The drum assembly can then be removed.

Note

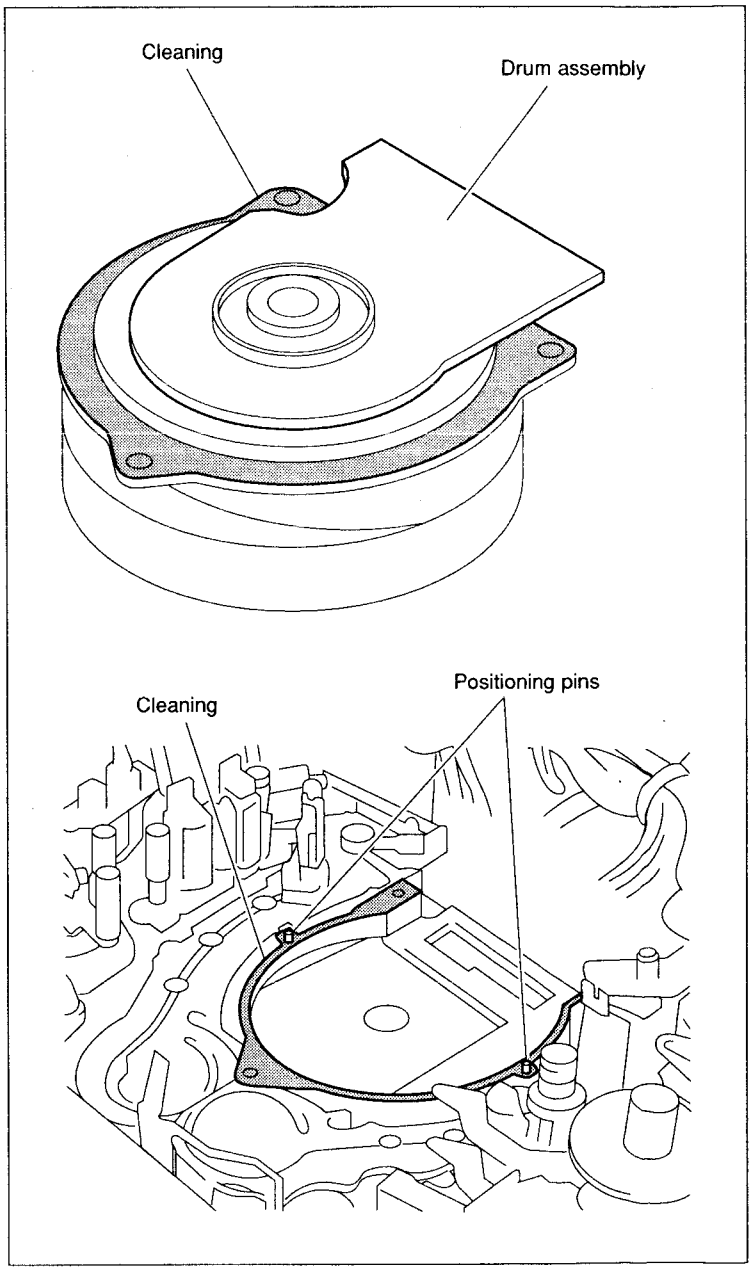
When removing the drum assembly be careful not to damage the CTL head, CUE/TC head, and peripheral tape guides.



Installation

3. Cleaning of contact surfaces

Clean the contact surfaces of a new drum assembly and chassis using a cleaning cloth moistened with cleaning fluid.



4. Drum assembly installation

(1) Hold the new drum assembly and connect the three connectors (CN1, CN2, and CN3) with disconnected in step 2).

Notes

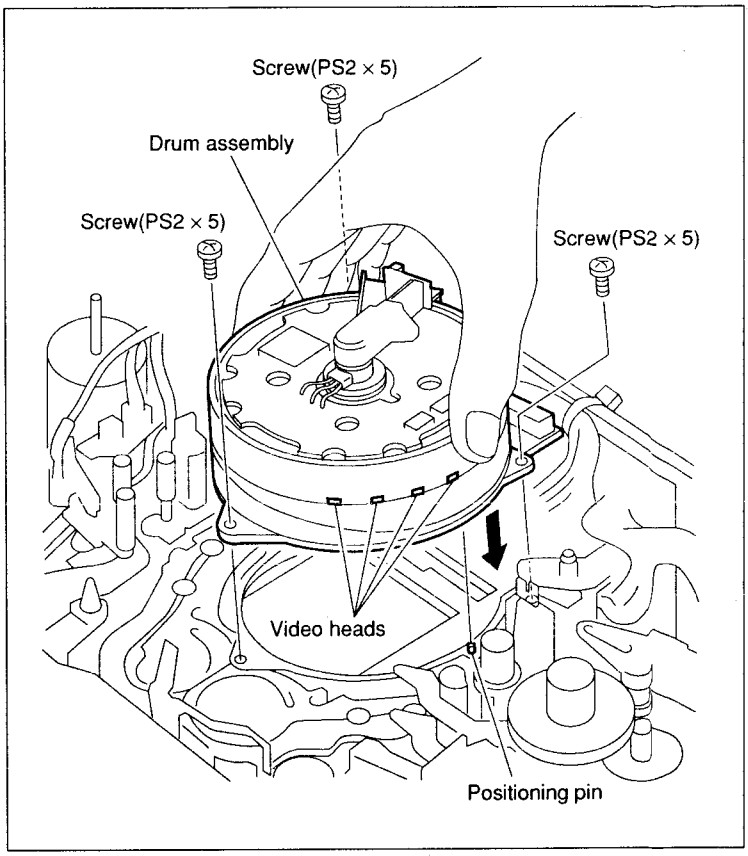
- Be sure to hold the no video head portions of the new drum assembly.
- Take care not to touch the drum assembly against the CTL head, CUE/TC head, and peripheral tape guides.

(2) Connect the harness connector to the brush board.

(3) Put the two positioning pins of the chassis to the holes of the drum assembly, then attach.

(4) Move the drum assembly a little and check that it is securely inserted in the positioning pins.

(5) Tighten the three screws.
Tightening torque: 19×10^{-2} N•m (1.9 kgf•cm)



5. Video head cleaner assembly installation

(1) Attach the video head cleaner assembly with one screw.

Note

Take care not to touch the video head cleaner assembly against the drum assembly (especially the video heads).

(2) Connect the harness connector of the video head cleaner solenoid to connector CN960 on the MB-601 board.

6. Cleaning of video heads and tape running surfaces

Clean the following area using a cleaning cloth moistened with cleaning fluid.

- Video heads (Refer to "5-1. Cleaning".)
- Tape running surface of the upper drum (Refer to "5-1. Cleaning".)
- Tape running surface and lead of the lower drum (Refer to "5-1. Cleaning".)

Note

After cleaning, be sure to wipe the relevant area using a dry cleaning cloth.

Adjustments after replacement

7. Video head cleaner assembly position adjustment (Refer to Section 6-14.)

8. Tape path adjustment (Refer to Section 7-1-1.)

9. Servo adjustment (Refer to Section 9-3.)

10. Video adjustment (Refer to Section 9-5-1, and 9-5-4 to 9-5-13.)

6-6. Driving Belt Replacement

Overviews

Driving belt removal
Cleaning
Driving belt installation
Closing the back side of chassis.

Caution

The replacement procedure for supply side driving belt is the same as for take-up side ones.

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power

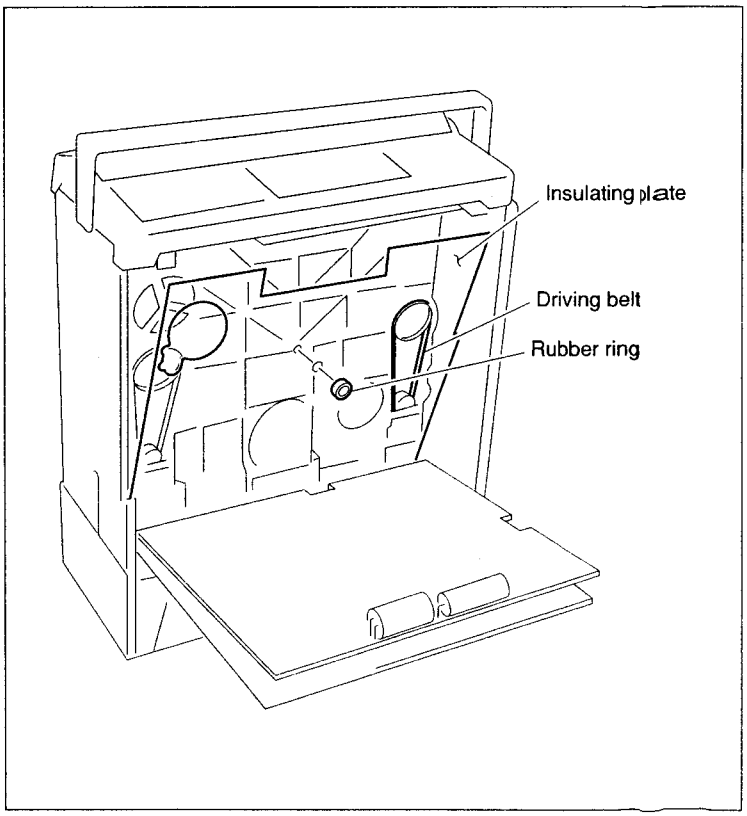
Tools

- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Removal

1. Driving belt removal

(1) Remove the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)
(2) Open the DPR-62 and SST-3 boards. (Refer to Section 8-2-1 and 8-3.)
(3) Remove the rubber ring attached to the boss in the center of the chassis, then remove the insulating plate.
(4) Remove the driving belt.

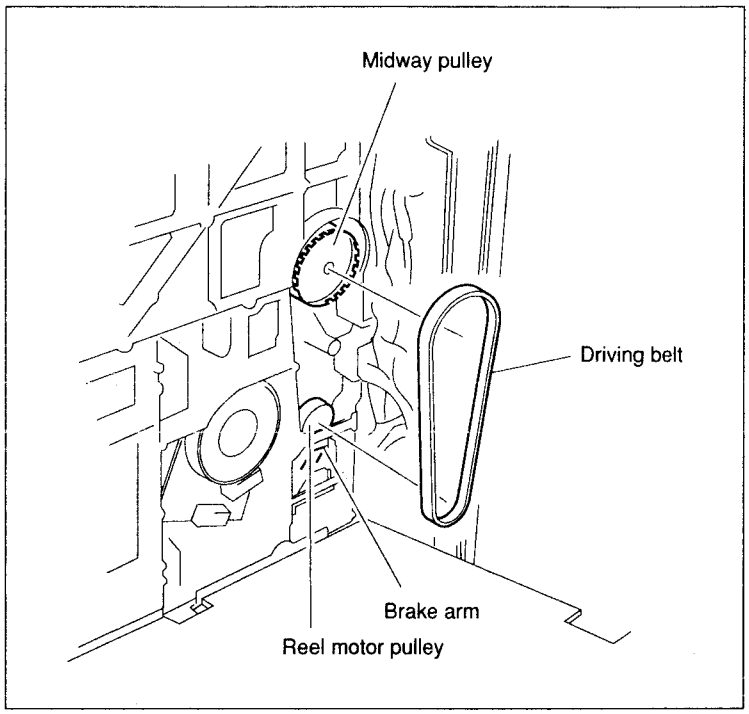


Installation

2. Cleaning

Clean the following portion using a cleaning cloth moistened with cleaning fluid.

- S/T reel motor pulley
- Surface of the S/T brake arm which touches the belt
- S/T Midway pulley
- New driving belt



3. Driving belt installation

(1) Put the driving belt on the motor pulley with its white marker outside while releasing the brake arm with finger.

(2) Put the driving belt on the Midway pulley while holding the driving belt so that it does not come off from the motor pulley.

(3) Rotate the relay pulley by hand two or three turns while releasing the brake arm with fingers, and check that the driving belt is put in the center of the motor pulley and Midway pulley.

4. Closing the back side of chassis.

(1) Insert the center hole of the insulating plate to the boss of the chassis, and fix it using the rubber ring.
- Check that each lever and pin are put into each hole of the insulating plate.

(2) Attach the DPR-62 and SST-3 boards. (Refer to Section 8-2-1 and 8-3.)

(3) Attach the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)

6-7. Pinch Roller Arm Assembly Replacement

Overviews

Replacement

Pinch roller arm assembly removal
Shaft cleaning
pinch roller arm assembly installation
Operation check
Pinch roller cleaning

Adjustment after replacement

Tape running check

Note

If the pinch roller worn-out, replace the pinch roller arm assembly.

Preparations

1. Put the unit in the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

Reference
The pinch roller arm assembly can replace with the cassette compartment attaches to the unit.

Note

When replacing, prepare a new stop washer (P/N 3-726-829-01).

Tools

- Stop washer fastening tool: J-6323-530-A
- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Removal

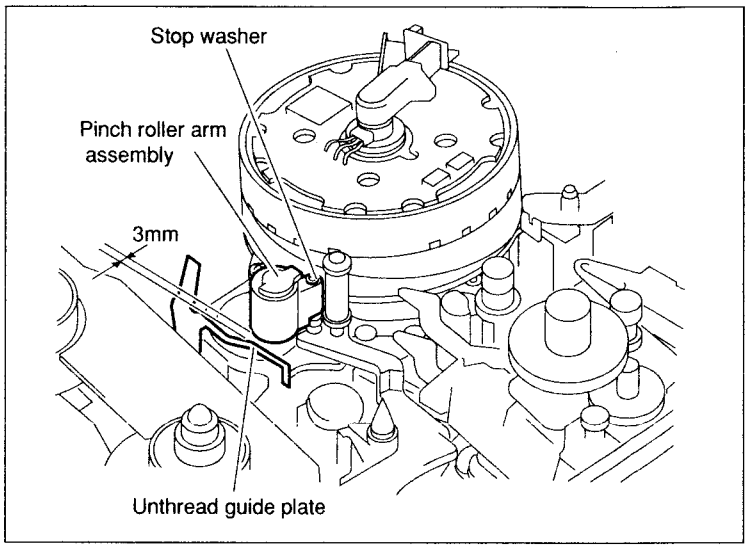
1. Pinch roller arm assembly removal

(1) Turn the manual eject gear clockwise and put the pinch roller in the position where is 3 mm away from the unthread guide plate.

(2) Remove the stop washer and the pinch roller arm assembly.

Notes

- Be careful not to lose the return spring when removing the pinch roller arm assembly.
- When removing, take care not to touch the tool against the drum and peripheral parts.



Installation

2. Shaft cleaning

Clean the fixing shaft of the pinch roller arm assembly using a cleaning cloth moistened with cleaning fluid.

3. Pinch roller arm assembly installation

(1) Pass a new pinch roller arm assembly through the fixing shaft and put the return spring as shown in the figure.

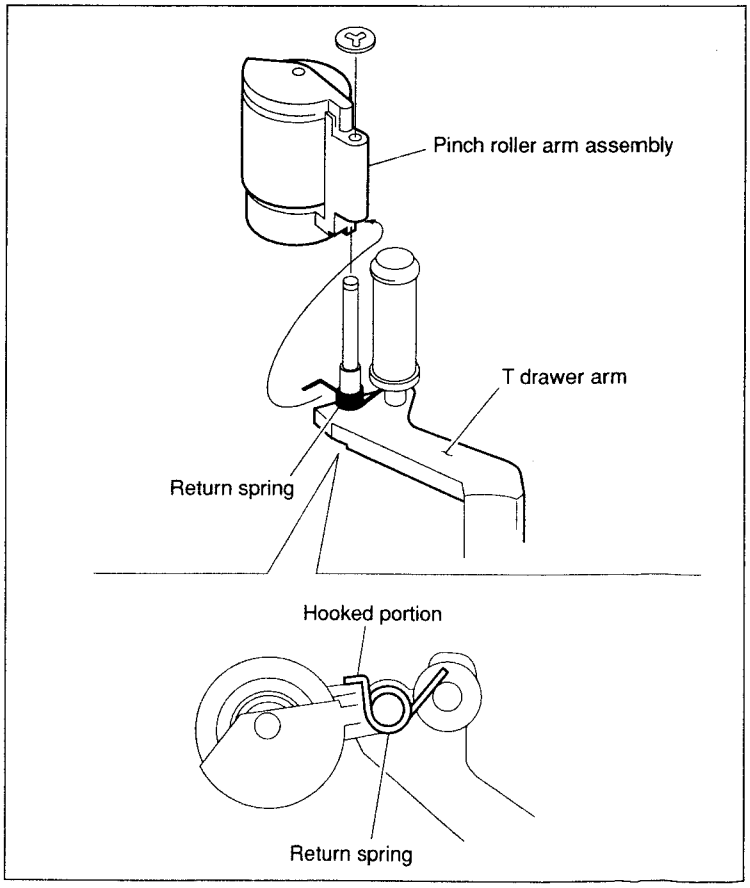
(2) Attach the pinch roller arm assembly using a new stop washer while holding the T drawing arm with fingers.

4. Operation check

Check that the pinchroller arm assembly smoothly returns when pushing the pinch roller arm assembly in the direction of the drum and releasing the fingers.

5. Pinch roller cleaning

Clean the pinch roller surface using a cleaning cloth moistened with cleaning fluid.



Adjustment after replacement

6. Tape running check (Refer to Section 7-1-1.)

6-8. Video Head Cleaning Roller Replacement

Overviews

Video head cleaner assembly removal
Video head cleaning roller replacement
Video head cleaner assembly installation
Video head cleaner assembly position adjustment
Operation check

Note

When replacing the video head cleaning roller, be careful not to damage the drum assembly, CTL head, and peripheral tape guides.

Preparations

1. Put the unit in the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

Note

When replacing, prepare a new CR spacer (P/N 3-182-765-02).

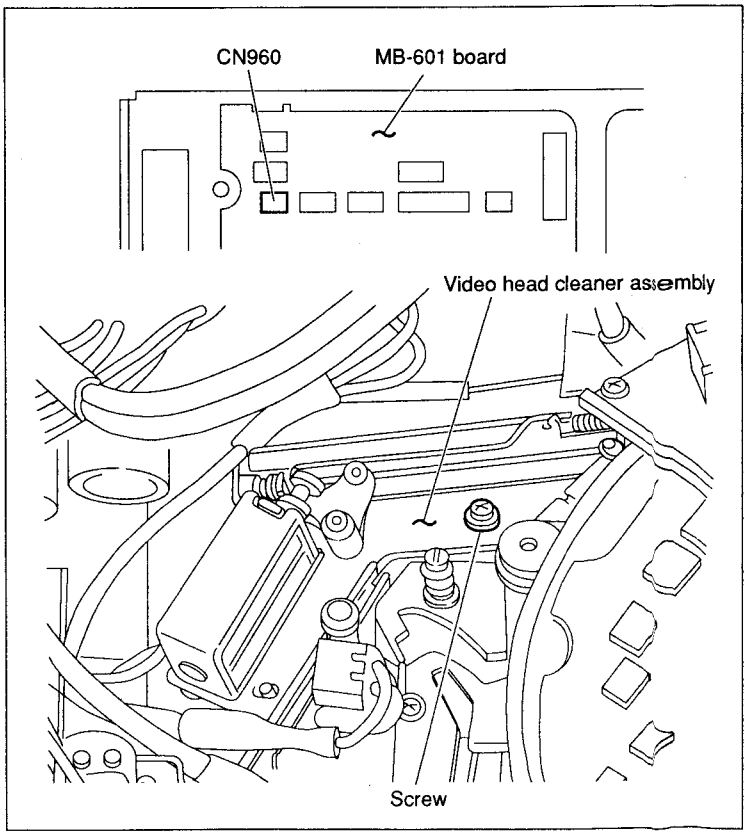
Removal

1. Video head cleaner assembly removal

(1) Disconnect connector CN960 (video head cleaner) on the MB-601 board.
(2) Remove one screw and the video head cleaner assembly.

Note

When removing, take care not to touch the cleaner assembly against the drum assembly (especially the video head).



Installation

2. Video head cleaning roller replacement

(1) Remove the CR spacer with fingers.
(2) Remove the video head cleaning roller.
(3) Insert a new video head cleaning roller into the shaft.

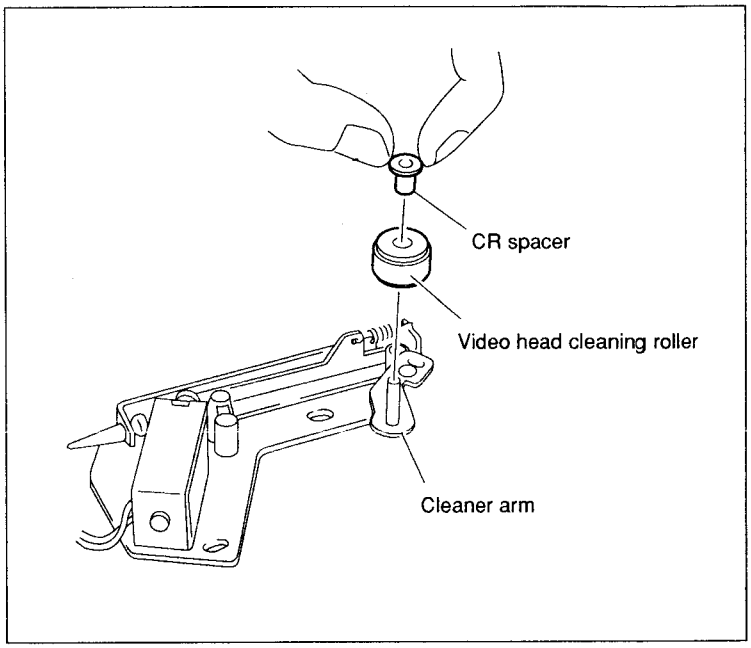
Note

The video head cleaning roller can install in either side due to no right-side up.

(4) Push the CR spacer with fingers as far as it will go while holding the indicated portion of the cleaner arm shown in the figure with fingers.
(5) Check that the tip of the shaft does not protrude from the CR spacer surface.

Notes

- It is recommended that the tip of the shaft is dented from the CR spacer surface by 0.3 mm.
- Do not stress excessive to the cleaner arm at pushing the CR spacer.
- Be careful not to touch the white felt portion of the video head cleaning roller as far as possible.
- Never apply oil to the white paper portion of the video head cleaning roller.



3. Video head cleaner assembly installation

(1) Temporarily attach the video head cleaner assembly with one screw.

Note

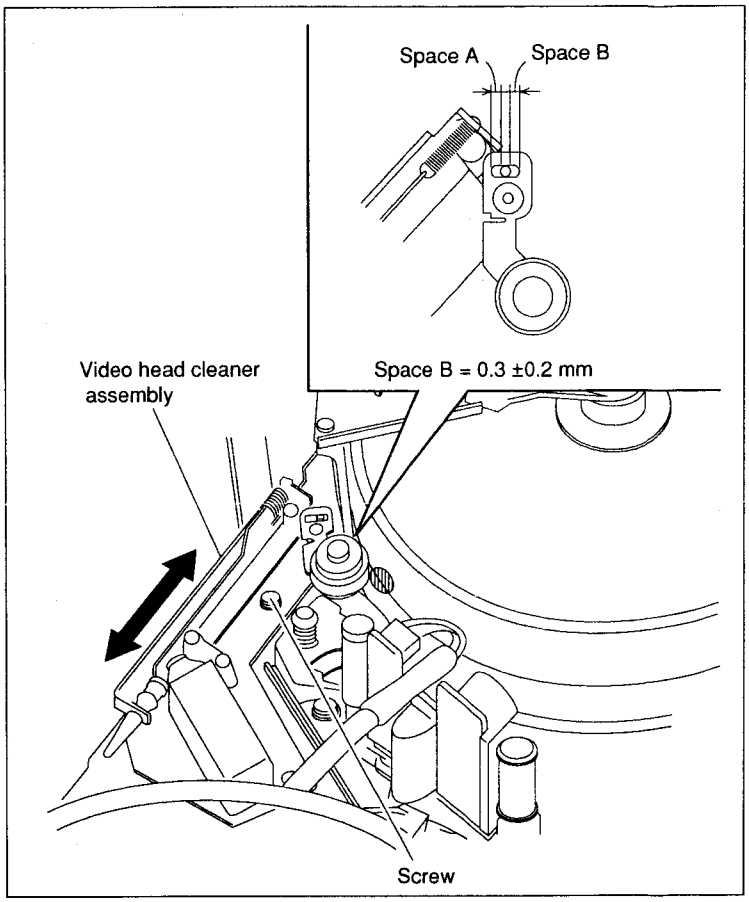
When installing, take care not to touch the video head cleaner assembly against the drum (especially the video head).

(2) Connect the harness connector to connector CN960 on the MB-601 board.

4. Video head cleaner assembly position adjustment

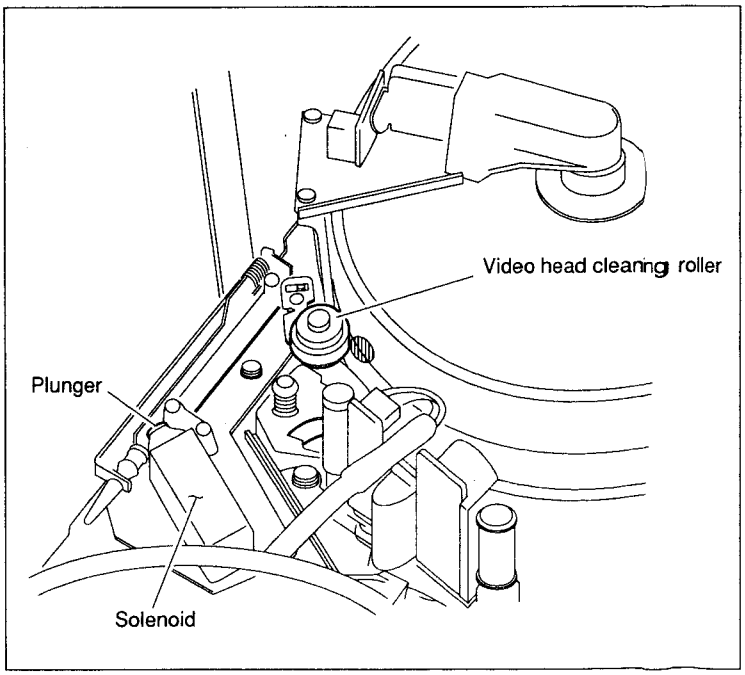
(1) Move the video head cleaner assembly in the direction of the arrow and tighten the one screw which temporarily fixed in step 3 so that the clearance between the pin and bracket meets the specification when the iron core of the solenoid is pushed with fingers to energized state.

(2) Check that the specification is met again.



5. Operation check

Push the iron core of the video head cleaner assembly solenoid with fingers to energized state. Check that the video head cleaning roller touches the drum (video head portion) shown in the figure.



6-9. Cue Brush Replacement

Overviews

Cue brush removal
Cue brush installation
Operation check

Preparations

1. Put the unit in the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

Note

When replacing, prepare a new stop washer (P/N 3-321-393-01).

Tool

- Stop washer fastening tool: J-6323-530-A

Removal

1. Cue brush removal

Remove the stop washer at the top of the cleaner arm and the cue brush.

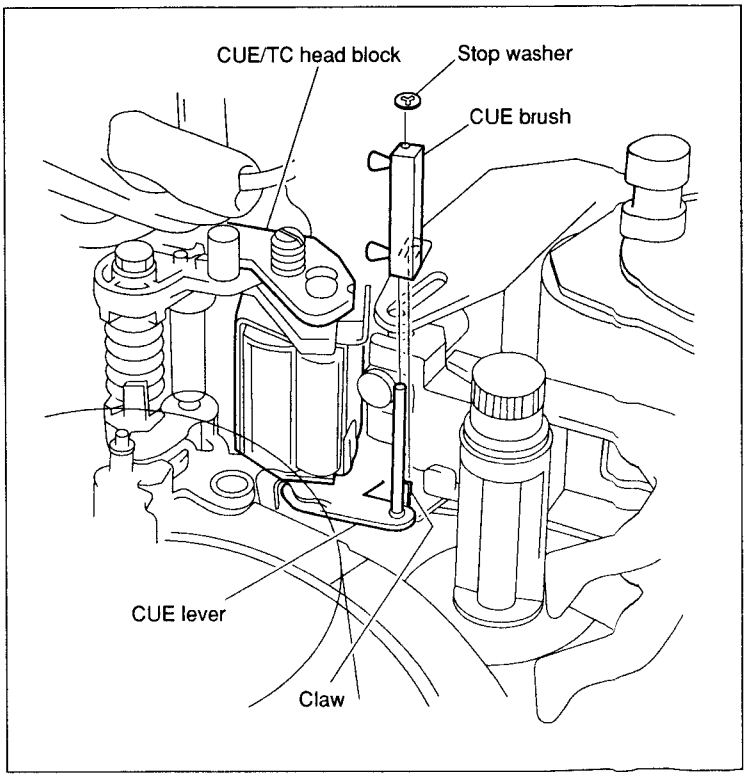
Installation

2. Cue brush installation

(1) Insert a new cue brush into the cleaner arm shaft and put the hole at the bottom of the cue brush securely in the hook of the cleaner arm.
(2) Attach the cue brush using a new stop washer while holding the cue lever with fingers.

3. Operation check

Check that the cue brush moves and touches the AUDIO/TC head surface for cleaning when the manual eject gear is turned clockwise and counterclockwise while it is pushed downward.



6-10. Pinch Solenoid Assembly Replacement

Overviews

Replacement

Pinch solenoid assembly removal
Pinch solenoid assembly installation

Adjustment after replacement

Pinch solenoid assembly position adjustment
Tape running check

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.
3. Removal the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the cassette compartment. (Refer to Section 1-6.)

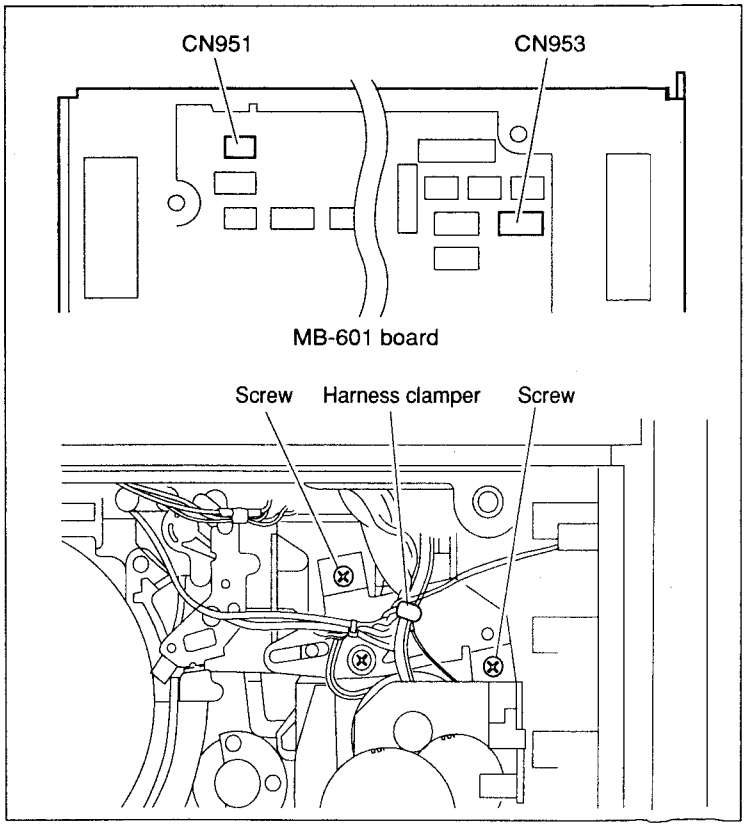
Tools

- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Wire clearance gauge : J-6152-450-A

Removal

1. Pinch solenoid assembly removal

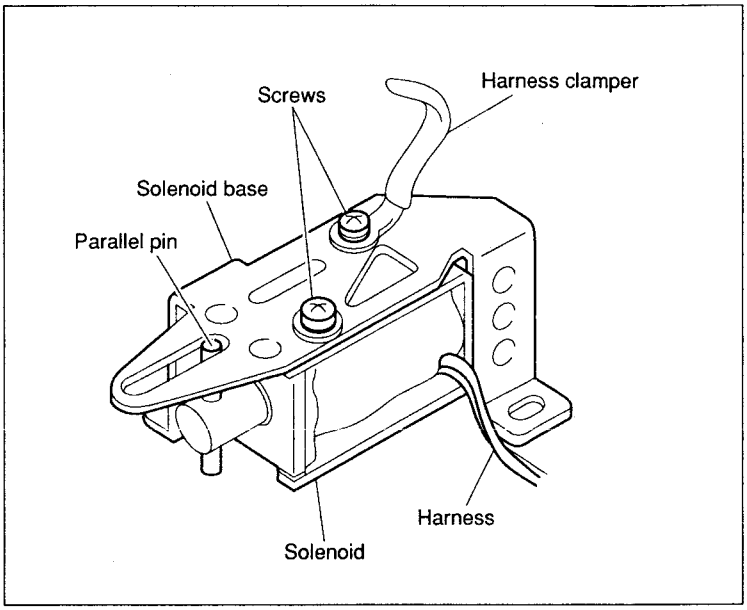
(1) Disconnect the connectors CN951 (reel motor) and CN953 (pinch solenoid) on the MB-601 board.
(2) Remove the two screws of the pinch solenoid assembly.
(3) Loosen the harness clamper.
(4) Turn the manual eject gear clockwise with fingers until the cue brush touches the CUE/TC head.
(5) Remove the pinch solenoid assembly from the unit while moving it toward the MB-601 board.



Installation

2. Pinch solenoid assembly installation

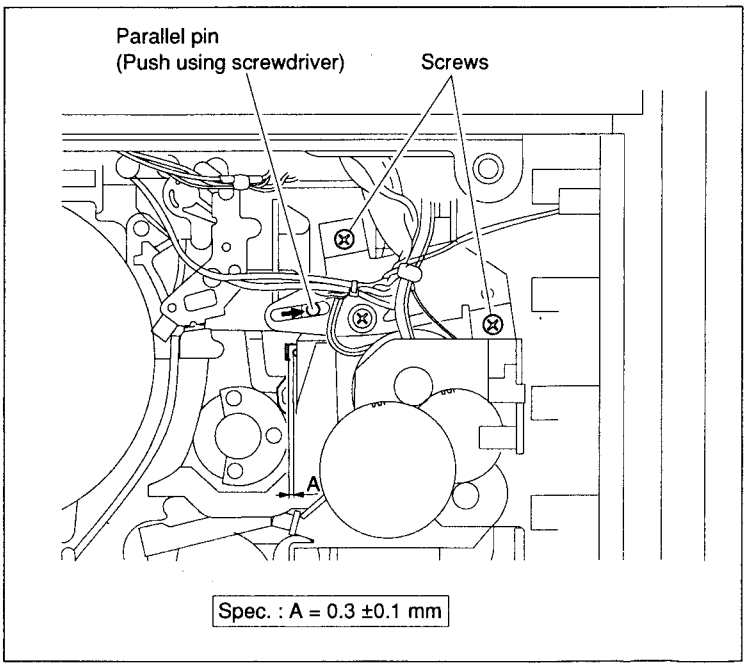
(1) Attach the pinch solenoid assembly to the chassis while putting the parallel pin of an iron core into the groove of the pinch lever, and fix the pinch solenoid assembly with the two screws.
(2) Connect the harness connector of the pinch solenoid to connector CN953 and the connector of the reel motor to connector CN951 on the MB-601 board.
(3) Fasten the harness by the harness clamper.



Adjustment after replacement

3. Pinch solenoid assembly position adjustment

(1) Put the unit into the threading end mode by turning the manual eject gear.
(2) Check that the clearance shown in the figure meets the specification when the upper portion of the parallel pin is pushed using a (–)2 mm flatblade screwdriver so that the iron core of the pinch solenoid is put into the energized state.
If not, perform the following steps.
(3) Loosen the two screws fixing the pinch solenoid assembly to the chassis, move the pinch solenoid assembly in the direction of the arrow, and tighten the screws.
(4) Perform step (2) again and check that the specification is met.



4. Tape running Check (Refer to Section 7-1-1.)

6-11. Tension Regulator Roller Replacement

Overviews

Replacement

Tension regulator roller (S5) replacement
Tape guide height check

Adjustment after replacement

Tape running rough adjustment
Tape path adjustment

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.

Tools

- Tape guide adjustment screwdriver: J-6321-500-A
- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Removal and installation

1. Tension regulator roller (S5) replacement

(1) Turn the setscrew at the top of the tension regulator roller counterclockwise by 180 degrees, then loosen.

Note

Do not tighten or loosen the setscrew until step (5) is completed after it is loosened. If tighten or loosen, the adjustment after tape guide roller replacement becomes difficult.

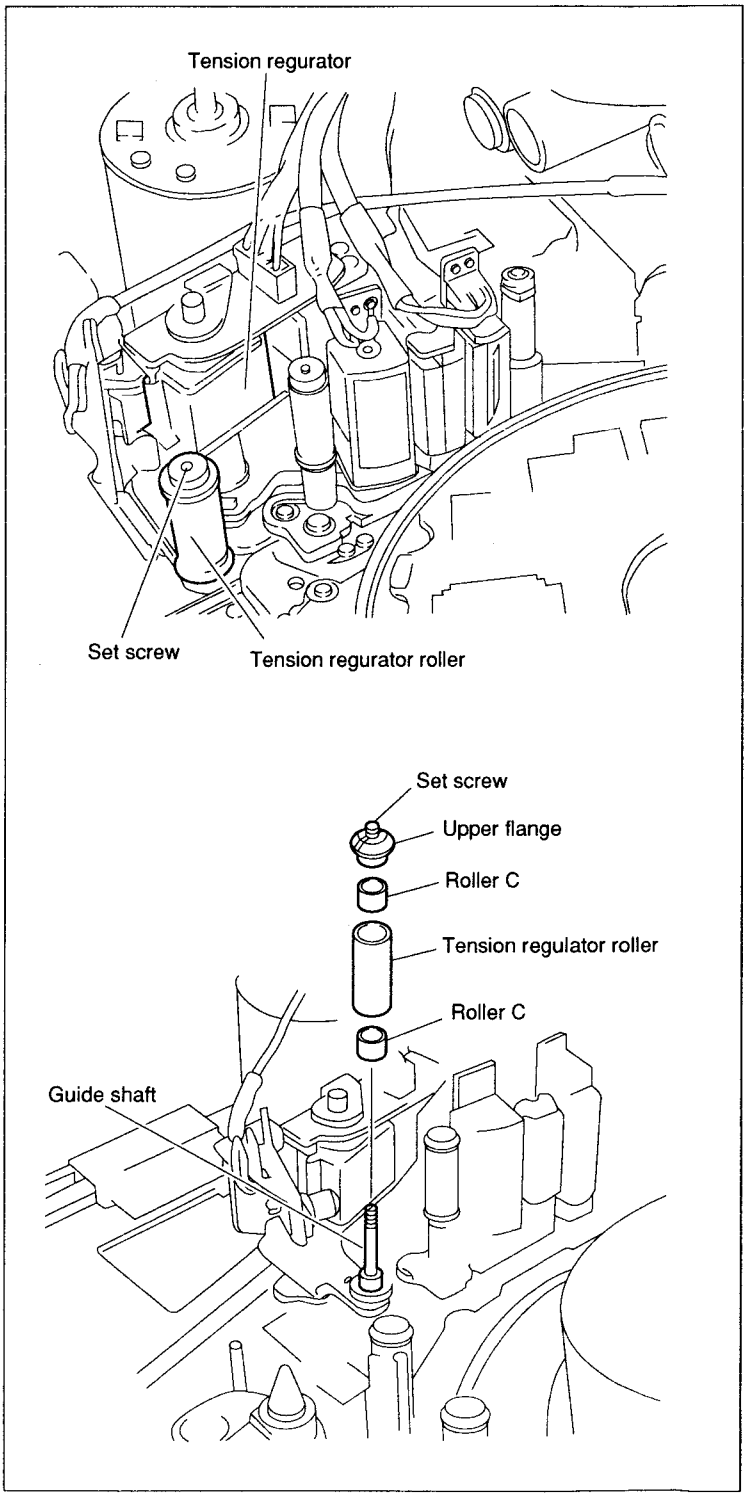
(2) Turn the upper flange counterclockwise and remove it.

(3) Remove the tension regulator roller, and remove two pieces of roller Cs simultaneously.

(4) Install the roller C, a new tension regulator roller and another roller C sequentially in the tape guide shaft.

(5) Turn the setscrew of the upper flange removed in step (2) clockwise by 180 degrees. (Turn same degrees in the opposite direction in step (1).)

(6) Turn the upper flange clockwise as far as it will go and attach it to the tape guide shaft.



2. Tape guide height check

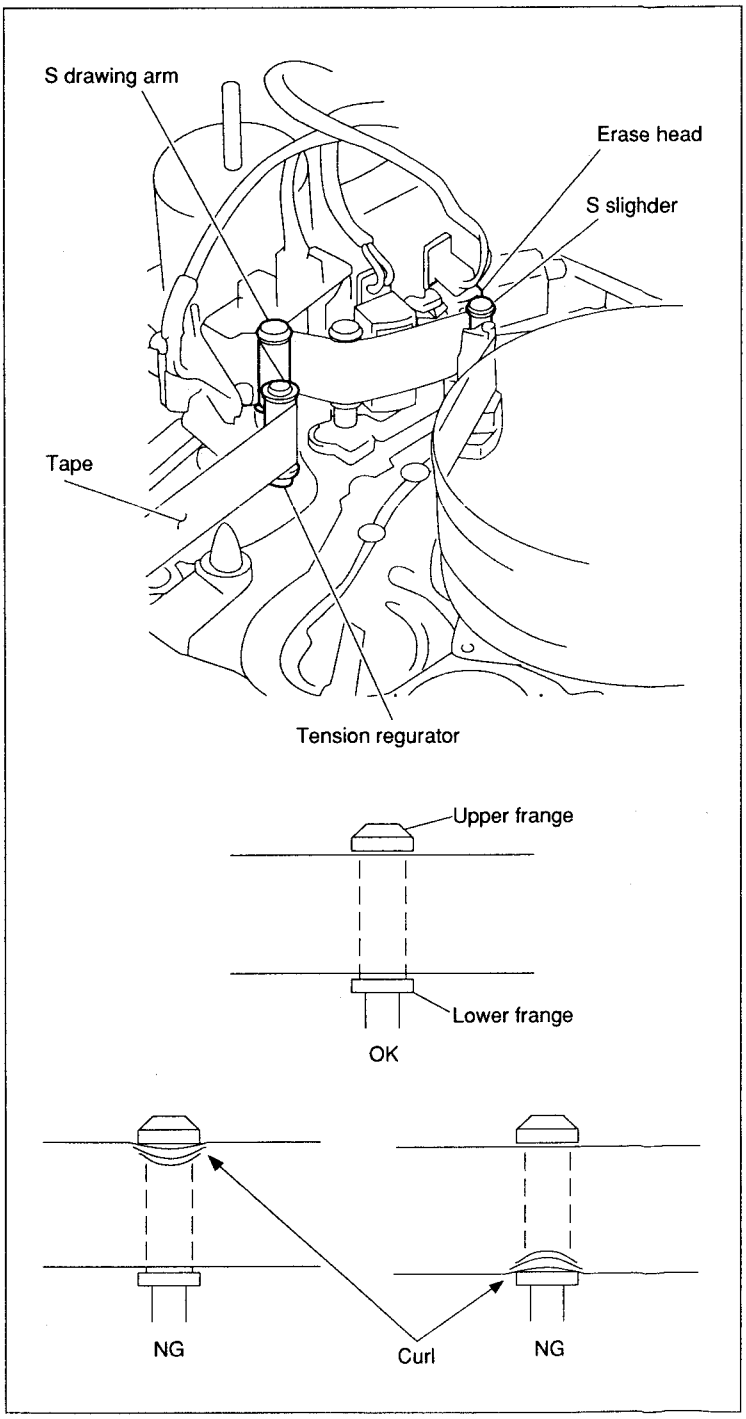
(1) Insert the cassette tape into the cassette compartment.

(2) Put the manual eject gear downward and turn it clockwise while pulling the brake release lever until the S slider reaches around the FE head.

(3) While putting the manual eject gear downward and pulling the brake release lever, turn the manual eject gear counterclockwise about 180 degrees so that the threaded tape is stretched taut.
The tape is then pulled out from the cassette tape and threaded to the tension regulator roller.

(4) Check that the tape is threaded without curling on the upper and lower flanges of the tension regulator roller. If the tape curls, adjust according to the following procedures.
(a) Loosen the setscrew of the upper flange.
(b) Turn the upper flange and eliminate the tape curl.
(c) Tighten the setscrew.

(5) Push the manual eject gear downward and turn it counterclockwise while pulling the T reel brake release lever.
The unit is then put into the unthreading mode, and the drawn tape is rewound to the cassette.



Adjustment after replacement

3. Tape running rough adjustment

(1) Turn on the power.
(2) Insert the used cassette tape into the cassette compartment.
(3) Put the unit into the PLAY mode and check that the tape runs without curling on the upper and lower flanges of the tension regulator roller. If the tape curls, adjust according to the following procedures.
  (a) Put the unit into the STOP mode.
  (b) Loosen the setscrew of the upper flange.
  (c) Turn the upper flange and eliminate the tape curl.
    • Tape curls on the lower flange: turn clockwise
    • Tape curls on the upper flange: turn counterclockwise
  (d) Tighten the setscrew.
  (e) Put the unit into the PLAY mode and check that the tape runs without curling.
(4) Press the EJECT button and take out the cassette tape.

4. Tape path adjustment (Refer to Section 7-1-1.)

6-12. S Reel Brake Solenoid Replacement

Overviews

Disconnection of connectors
S reel motor assembly removal
S reel brake solenoid replacement
Solenoid position adjustment
Locking compound applying
Opening the back side of chassis
Cleaning
S reel motor assembly installation
Closing the back side of chassis
Connection of connectors

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

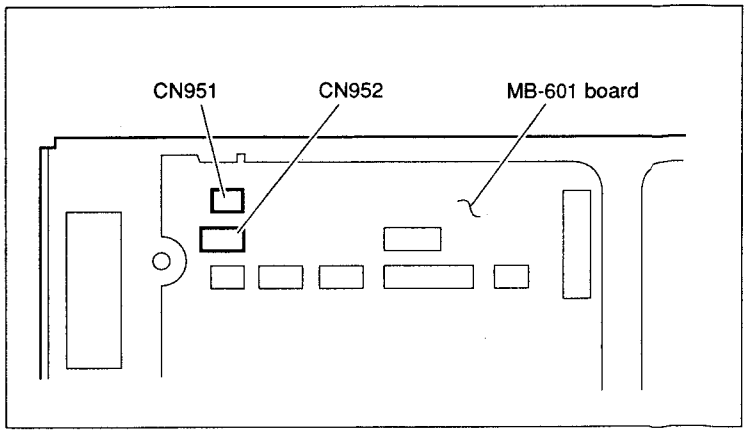
Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Thickness gauge : 9-911-053-00
- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Removal

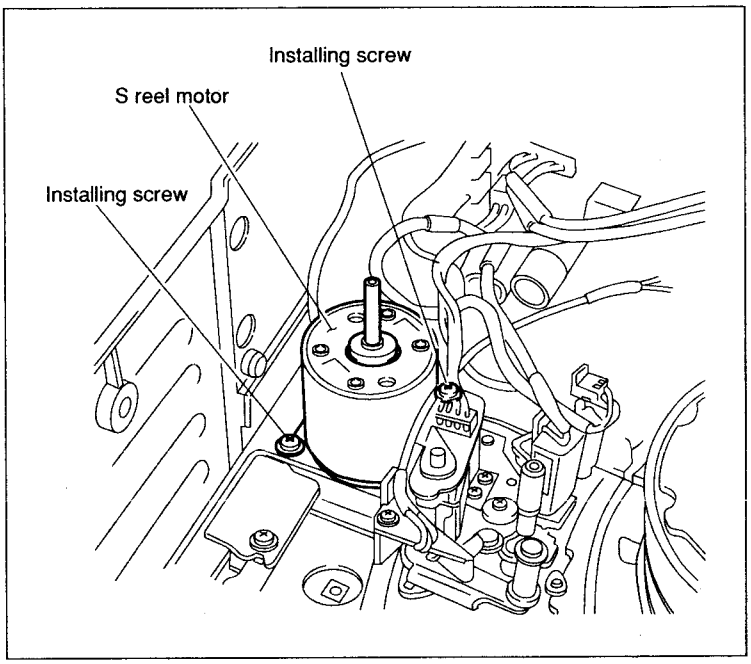
1. Disconnection of connectors

(1) Disconnect the connectors CN951 (S reel motor) and CN952 (S brake solenoid) on the MB-601 board.



2. S reel motor assembly removal

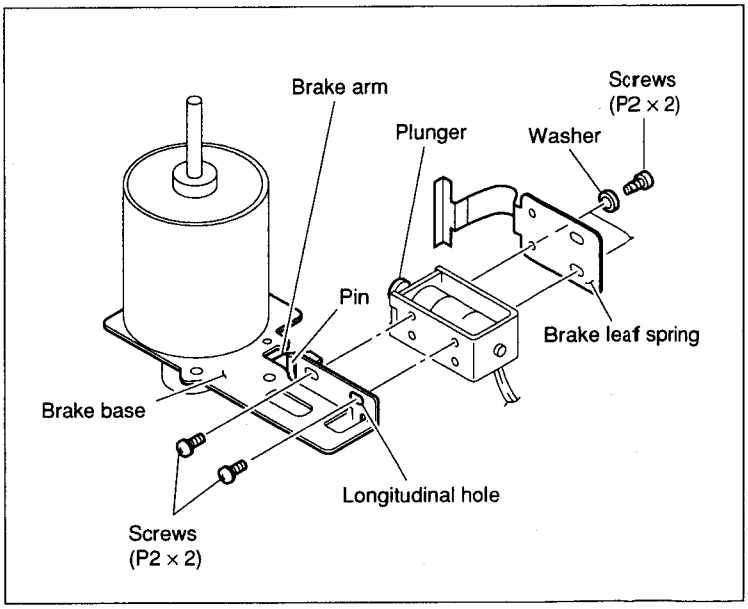
Remove the two screws and the S reel motor. At that time, the driving belt put on the S reel motor pulley on the back side of the chassis is came off at the same time, and it is left on the back side of the chassis.



Installation

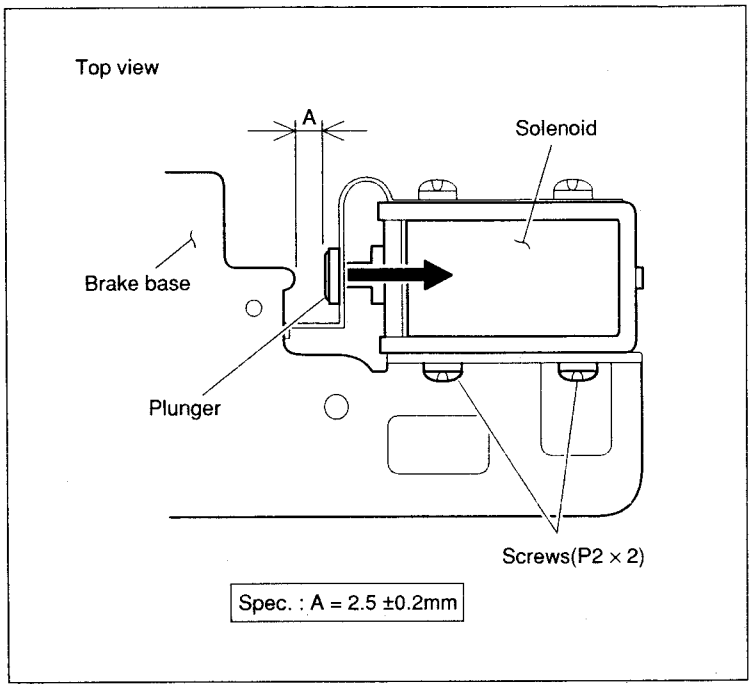
3. S reel brake solenoid replacement

(1) Remove the two screws and brake leaf spring.
(2) Remove the two screws on the opposite side, and remove the solenoid from the brake base.
(3) Put the shaft of the brake arm in the groove of the iron core of a new solenoid, and temporarily attach the solenoid to the center of the longitudinal holes of the brake base using two screws.
(4) Attach the brake leaf spring using two screws.



4. Solenoid position adjustment

(1) Push the iron core of the solenoid in the energized direction, and put a thickness gauge (2.5 mm thick) between the top of the iron core and brake base shown in the figure.
(2) Push the solenoid temporarily attached in step 3) to the motor side while maintaining the state in step (1), and tighten the two screws.
(3) Pull out the thickness gauge.
(4) Check that the clearance between the iron core and brake base meets the specification when the iron core is pushed with fingers to energized state.
If not, repeat steps (1) and (2).



5. Locking compound applying

Apply locking compound slightly to the four screws tightened in steps 3) and 4).

6. Opening the back side of chassis.

(1) Remove the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)
(2) Open the DPR-62 and SST-3 boards. (Refer to Section 8-2-1 and 8-3.)
(3) Remove the rubber ring attached to the boss in the center of the chassis, then remove the insulating plate.
(4) Remove the driving belt left in step 2.

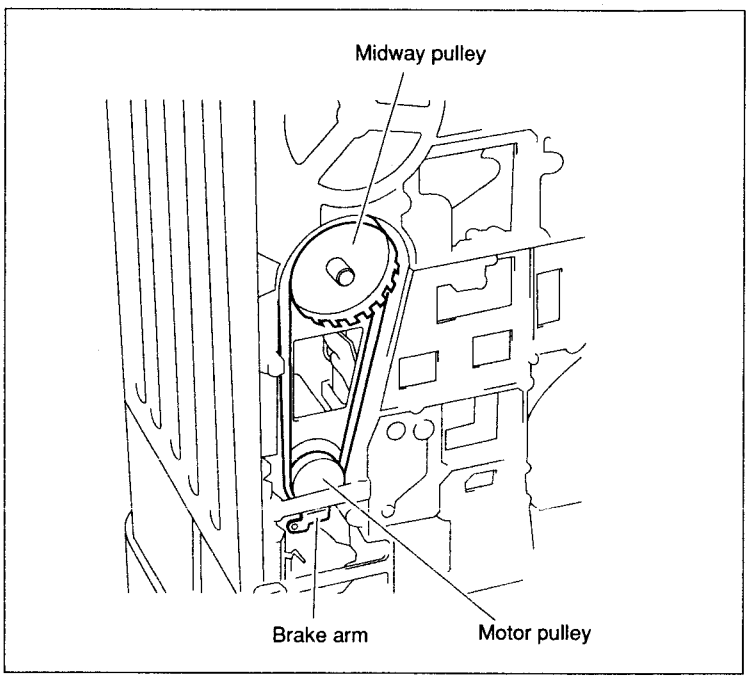
7. Cleaning

Clean the following portions using a cleaning piece moistened with cleaning fluid.

- S reel motor pulley
- Surface of the brake arm which touches the belt
- Driving belt
- Midway pulley

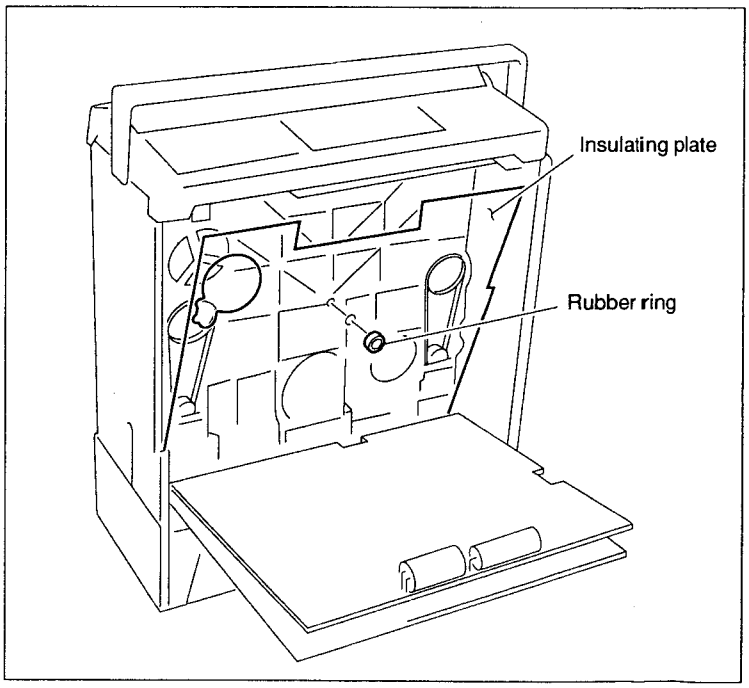
8. S reel motor assembly installation

(1) Put the driving belt (its white maker outside) around the hole which passing through the S reel motor assembly on the back side of the chassis.
(2) Install the S reel motor assembly from the top of the chassis, and put the driving belt on the motor pulley while releasing the brake arm with finger.
(3) Tighten the S reel motor assembly using two screws.
(4) Put the driving belt on the relay pulley while holding the driving belt so that it does not come off from the motor pulley.
(5) Rotate the relay pulley by hand two or three turns while releasing the brake arm with finger, and check that the driving belt is put in the center of the motor pulley and relay pulley.



9. Closing the back side of chassis.

(1) Insert the center hole of the insulating plate to the boss of the chassis, and fix it using a rubber ring.
  • Check that each lever and pin are put into each hole of the insulating plate.
(2) Attach the DPR-62 and SST-3 boards. (Refer to Section 8-2-1 and 8-3.)
(3) Attach the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)



10. Connection of connectors

Connect the harness connectors to the following connectors on the MB-601 board.

• CN951: Harness connector of S reel motor
• CN952: Harness connector of S brake solenoid

6-13. T Reel Brake Solenoid Replacement

Overviews

Replacement

Disconnection of connectors
Manual eject assembly removal
Pinch solenoid assembly removal
T reel motor assembly removal
T reel brake solenoid replacement
Solenoid position adjustment
Brake leaf spring and brake release lever assembly installation
Locking compound applying
Opening the back side of chassis
Cleaning
T reel motor assembly installation
Closing the back side of chassis
Pinch solenoid assembly installation
Manual eject assembly installation
Pinch solenoid assembly position adjustment
Connection of connectors
Manual eject assembly position adjustment

Adjustment after replacement

Tape running check

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the cassette compartment. (Refer to Section 1-6.)

Tools

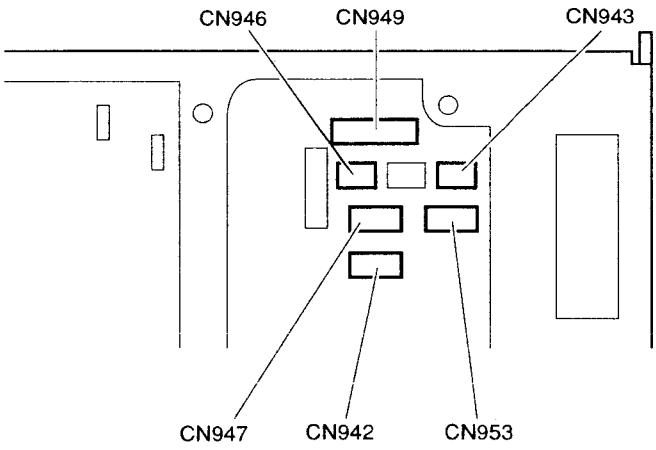
- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Thickness gauge : 9-911-053-00
- Wire clearance gauge : J-6152-450-A
- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Removal

1. Disconnection of connectors

Disconnect the following connectors on the MB-601 board.

- CN946: Gear block assembly
- CN943: T reel motor
- CN953: Pinch solenoid
- CN947: TC head
- CN949: TC/CUE erase head
- CN942: T brake solenoid

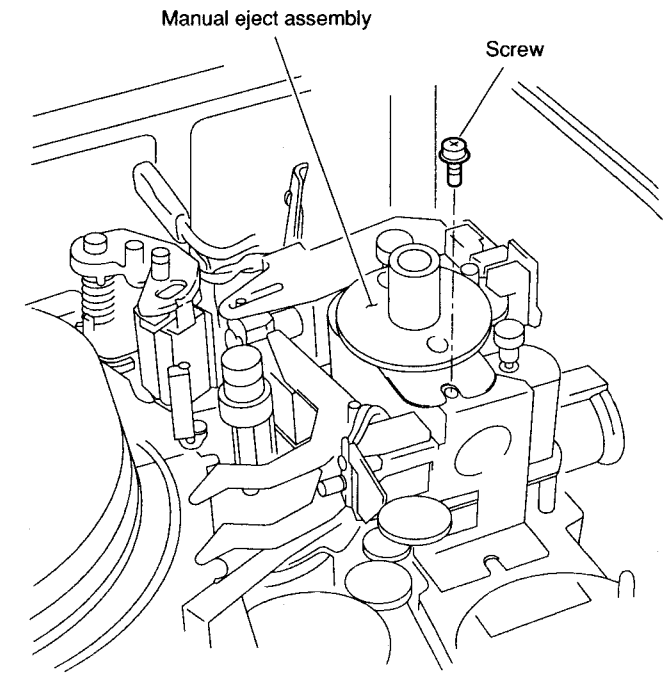


Right part of MB-601 board

2. Manual eject assembly removal

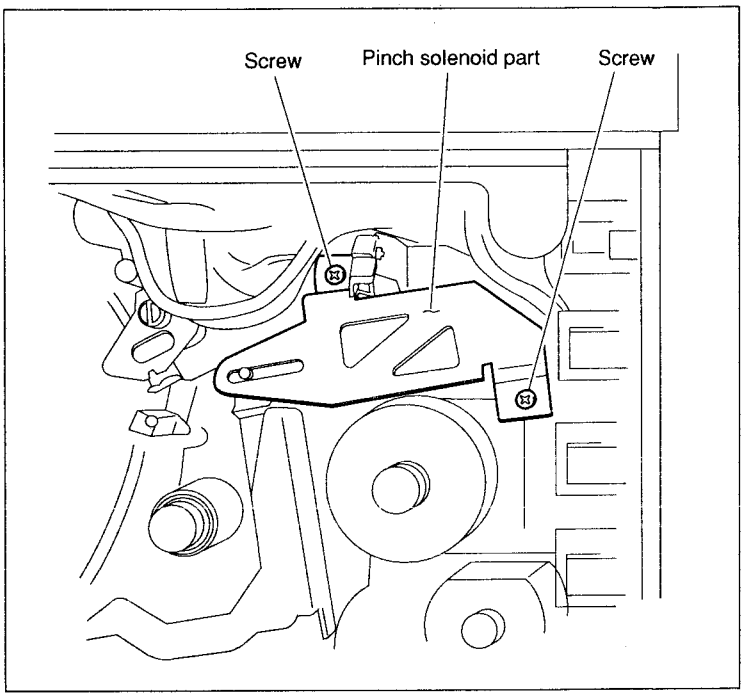
(1) Remove one screw and lift above the manual eject assembly.

(2) Disconnect the connector (CN1) on the DET-15 board of the manual eject assembly.



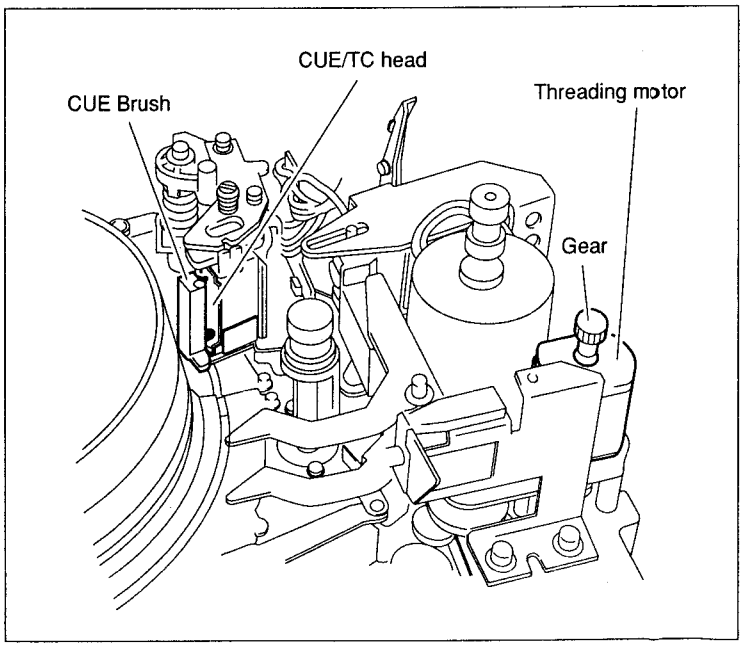
3. Pinch solenoid assembly removal

(1) Remove the two screws of the pinch solenoid assembly.



(2) Turn the gear at the top of the threading motor clockwise with fingers until the cue brush touches the CUE/TC head.

(3) Remove the pinch solenoid assembly from the chassis while moving it toward the MB-601 board.

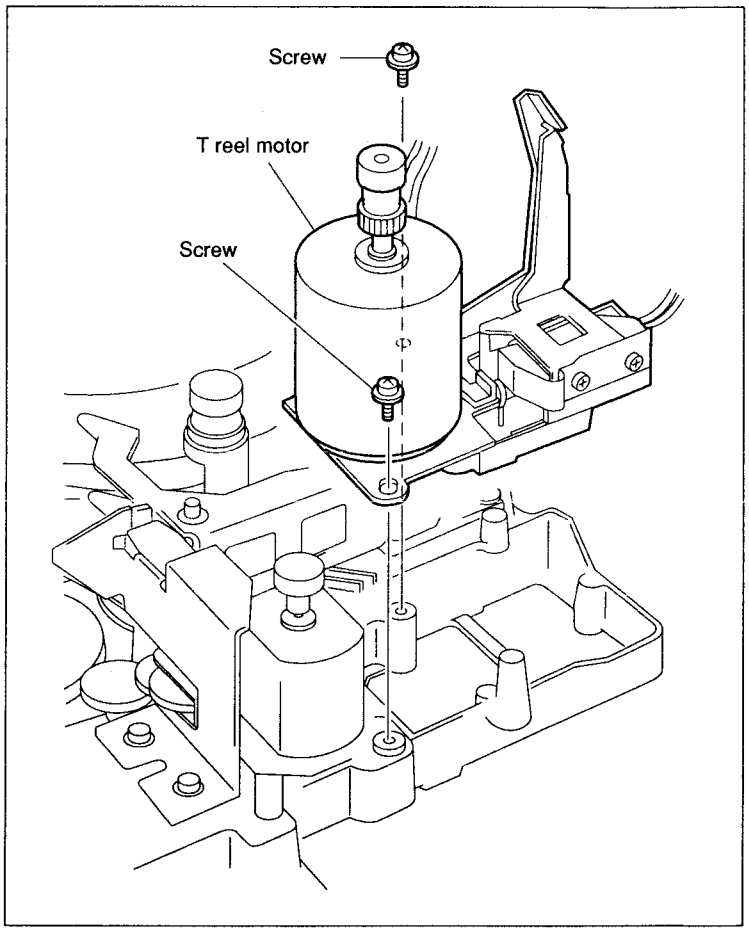


4. T reel motor assembly removal

Remove the two screws and T reel motor assembly.

Note

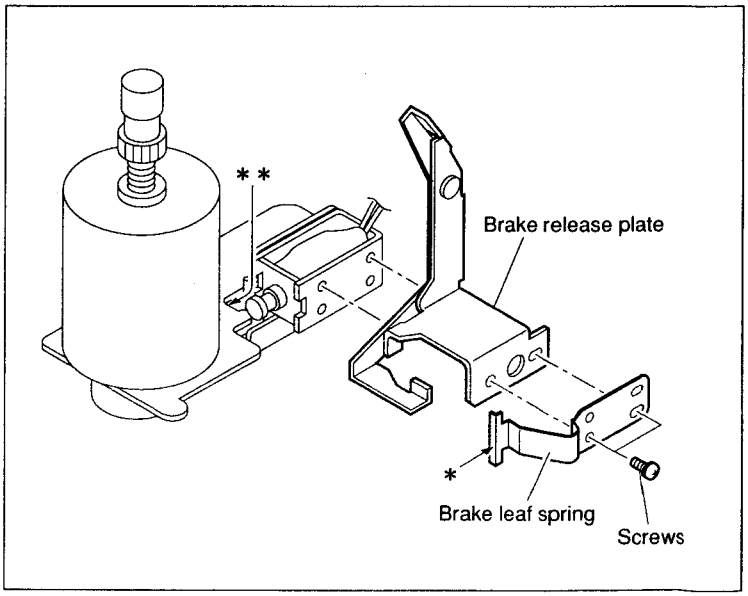
At that time, the driving belt put on the T reel motor pulley on the back side of the chassis is came off together, and it is left on the back side of the chassis.



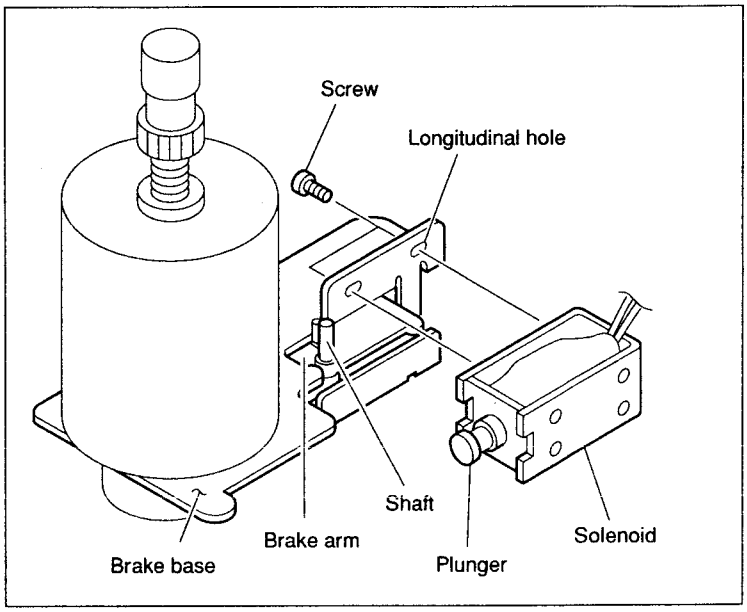
Installation

5. T reel brake solenoid replacement

(1) Remove the two screws shown in the figure, then remove the brake leaf spring and brake release lever assembly.

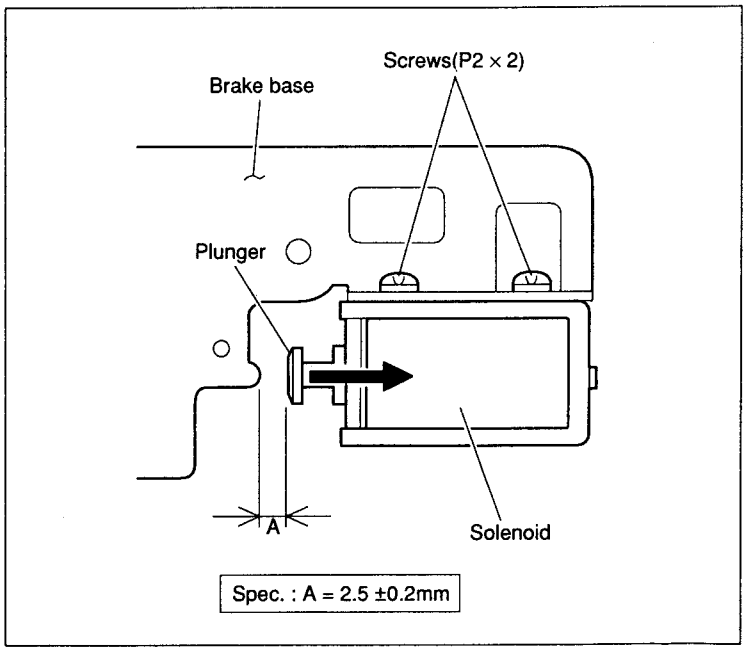


(2) Remove the two screws on the opposite side, and remove the solenoid from the brake base.
(3) Put the shaft of the brake arm in the groove of the iron core of a new solenoid, and temporarily attach the solenoid to the center of the longitudinal holes of the brake base using two screws.



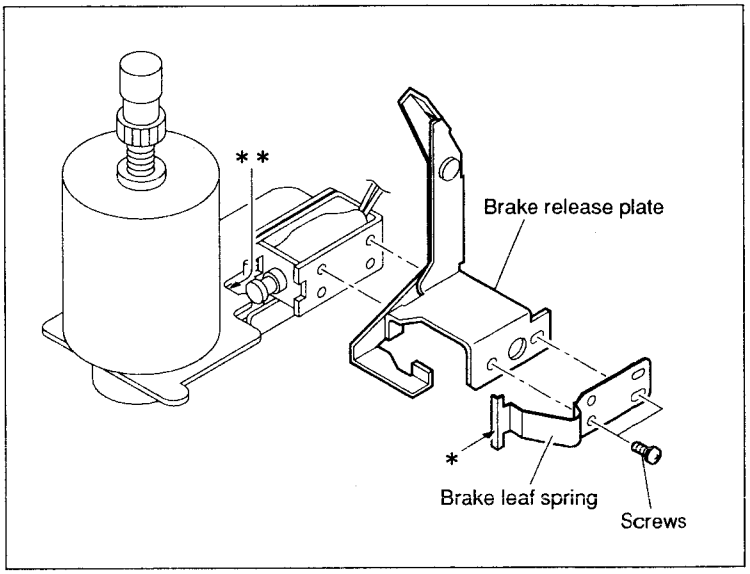
6. Solenoid position adjustment

(1) Push the iron core of the plunger in the energized direction, and put a thickness gauge (2.5 mm thick) between the top of the iron core and brake base shown in the figure.
(2) Push the solenoid temporarily attached in step (3) of 5) to the motor side while maintaining the state in step (1), and tighten the two screws.
(3) Pull out the thickness gauge.
(4) Check that the clearance between the iron core and brake base meets the specification when the iron core is pushed with fingers to energized state.
If not, repeat steps (1) and (2).



7. Brake leaf spring and brake release lever assembly installation

(1) Combine the brake leaf spring and brake release lever assembly and attach it in the solenoid using two screws.
(2) Check that the * portion of the brake leaf spring touches the ** portion of the brake base shown in the figure.
(3) Check that the iron core of the solenoid moves in the energized direction when the red-colored labeled portion of the brake release lever assembly is pulled toward the motor.



8. Locking compound applying

Apply locking compound slightly to the four screws tightened in steps 6) and 7).

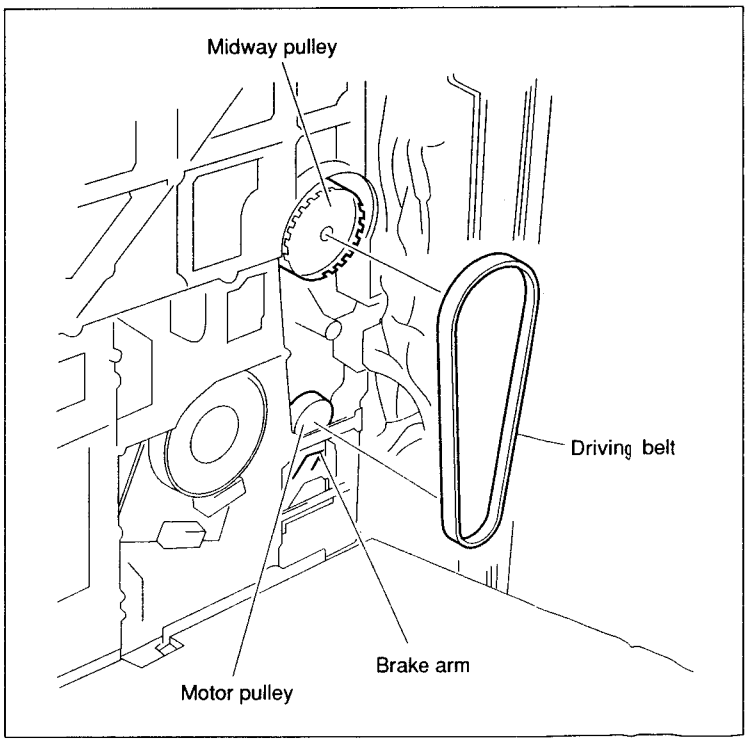
9. Opening the back side of chassis.

(1) Remove the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)
(2) Open the DPR-62 and SST-3 boards. (Refer to Section 8-2-1 and 8-3.)
(3) Remove the rubber ring attached to the boss in the center of the chassis, then remove the insulating plate.
(4) Remove the driving belt left in step 4).

10. Cleaning

Clean the following portions using a cleaning piece moistened with cleaning fluid.

- T reel motor pulley
- Surface of the brake arm which touches the belt
- Driving belt
- Midway pulley



11. T reel motor assembly installation

(1) Put the driving belt (its white marker outside) around the hole which passing through the T reel motor assembly on the back side of the chassis.
(2) Install the T reel motor assembly from the top of the chassis, and put the driving belt on the motor pulley while releasing the brake arm with finger.
(3) Tighten the T reel motor assembly using two screws.
(4) Put the driving belt on the Midway pulley while holding the driving belt so that it does not come off from the motor pulley.
(5) Rotate the relay pulley by hand two or three turns while releasing the brake arm with finger, and check that the driving belt is put in the center of the motor pulley and Midway pulley.

12. Closing the back side of chassis

(1) Insert the center hole of the insulating plate to the boss of the chassis, and fix it by the rubber ring.
  • Check that each lever and pin are put in each hole of the insulating plate.
(2) Attach the DPR-62 and SST-3 boards. (Refer to Section 8-2-1 and 8-3.)
(3) Attach the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)

13. Pinch solenoid assembly installation

Attach the pinch solenoid assembly. (Refer to Section 6-10.)

14. Manual eject assembly installation

(1) Connect the harness connector to CN1 on the DET-15 board of the manual eject assembly.
(2) Pass the hole of the manual eject assembly through the T reel motor shaft, and engage the black gear on the manual eject assembly with the gears of the threading motor and T reel motor.
(3) Attach the manual eject assembly using one screw.

15. Pinch solenoid assembly position adjustment

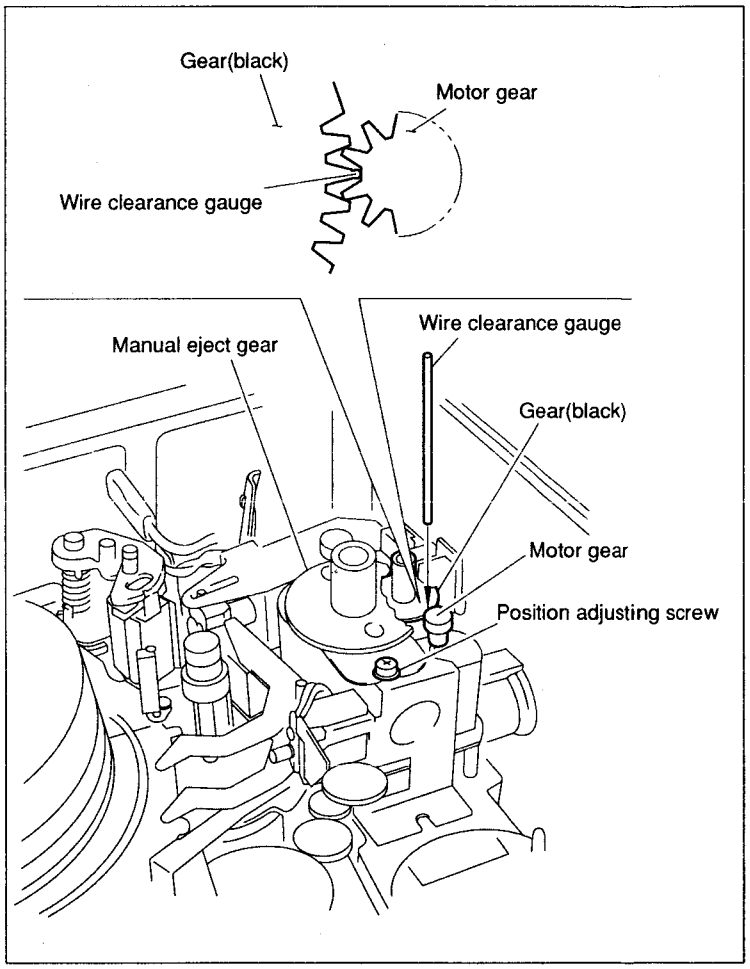
Adjust the position of the pinch solenoid assembly. (Refer to Section 6-10.)

16. Connection of connectors

Connect the harness connectors to the following connectors on the MB-601 board.
• CN946: Harness connector of gear block assembly
• CN943: Harness connector of T reel motor
• CN953: Harness connector of pinch solenoid
• CN947: Harness connector of TC head
• CN949: Harness connector of CUE/TC erase head
• CN942 : Harness connector of T brake solenoid

17. Manual eject assembly position adjustment

(1) Insert a screwdriver into the hole of the manual eject gear and loosen the screw shown in the figure.
(2) Put a wire clearance gauge of 0.3 mm in diameter between the gear(black) and threading motor gear as shown in the figure, and push the manual eject gear toward the motor gear.
(3) Tighten the screw through the hole of the manual eject gear while maintaining the state in step (2).
The position of the manual eject assembly is then adjusted.
(4) Pull out the wire clearance gauge.



Adjustment after replacement

18. Tape running Check (Refer to Section 7-1-1.)

6-14. Video Head Cleaner Solenoid Replacement

Overviews

Video head cleaner assembly removal
Cleaner solenoid replacement
Video head cleaner assembly installation
Video head cleaner assembly position adjustment
Operation check

Note

When replacing, be careful not to damage the CTL head, drum assembly, and peripheral tape guides. Especially, be careful not to damage the video heads of the drum assembly during replacement.

Preparations

1. Put the unit in the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

Removal

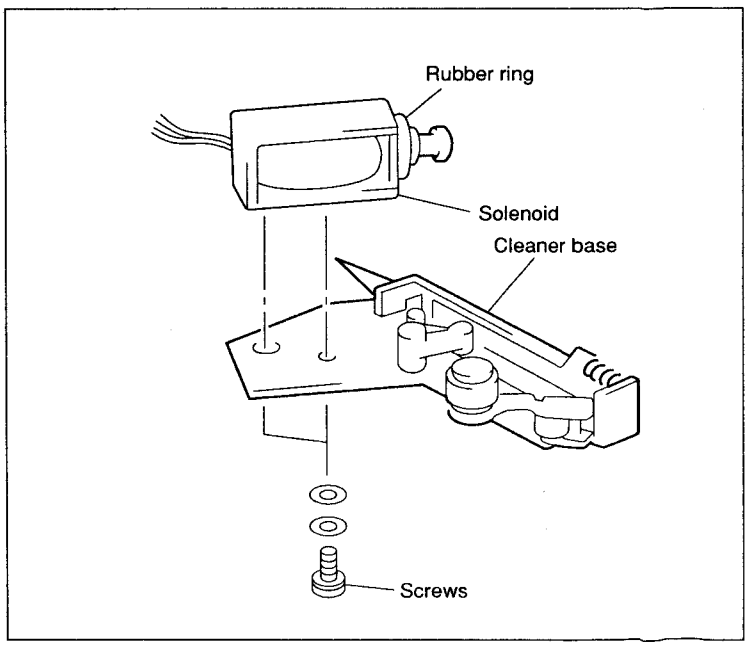
1. Video head cleaner assembly removal

Remove the video head cleaner assembly. (Refer to Section 6-8.)

Installation

2. Cleaner solenoid replacement

(1) Remove the two screws at the back of the video head cleaner assembly, and remove the solenoid.
(2) Remove the rubber ring shown in figure, and install it to new solenoid.
(3) Attach a new solenoid to the cleaner base in the direction shown in the figure while putting the groove of the iron core of the solenoid in the boss of the solenoid lever, and tighten it with the two screws.



3. Video head cleaner assembly installation

Attach the video head cleaner assembly. (Refer to Section 6-8.)

4. Video head cleaner assembly position adjustment

Adjust the position of the video head cleaner assembly. (Refer to Section 6-8.)

5. Operation check

Check that the video head cleaner operates normally. (Refer to Section 6-8.)

6-15. Capstan Motor Replacement

Overviews

Replacement

Mode setting
Opening the back side of chassis
Capstan motor removal
Capstan motor installation
Closing the back side of chassis
Cleaning

Adjustment after replacement

Servo adjustment

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the cassette compartment. (Refer to Section 1-6.)
5. Remove the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)

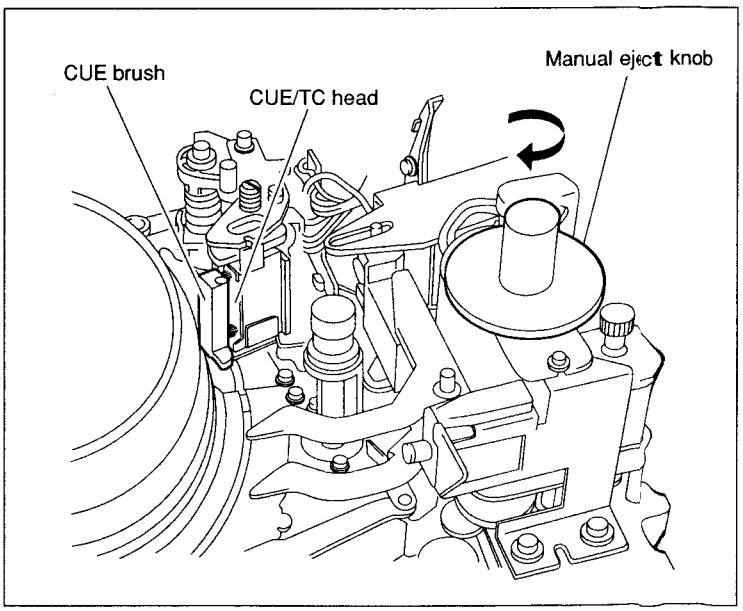
Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Removal

1. Mode setting

Turn the manual eject gear clockwise until the cue brush touches the CUE/TC head.



2. Opening the back side of chassis.

(1) Open the DPR-62 and SST-3 boards. (Refer to Section 8-2-1 and 8-3.)

(2) Remove the rubber ring attached to the boss in the center of the chassis and open the front panel side of the insulating plate.

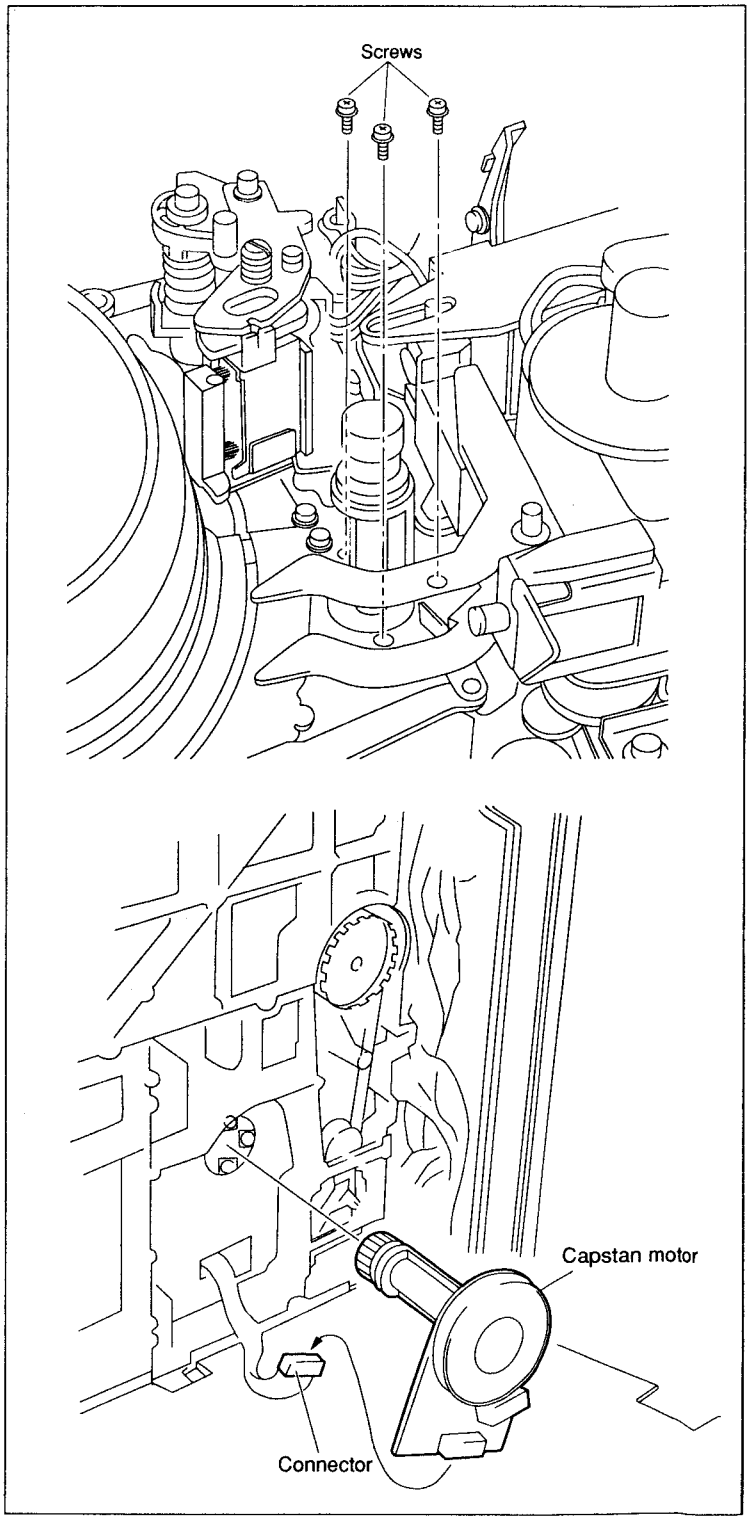
3. Capstan motor removal

(1) Disconnect the connector connected to the capstan motor at the back of the unit.

(2) Remove the three screws from the top of the chassis while holding the capstan motor with hand, and remove the capstan motor from the back side of the chassis.

Note

Be careful not to fall the capstan motor.



Installation

4. Capstan motor installation

(1) Pass a new capstan motor through the hole of the chassis in the direction shown in the figure and tighten it with the three screws.

Note

When passing through the hole, be careful not to scratch the capstan motor shaft.

(2) Connect the connector passing through the hole of the insulating plate to the capstan motor board.

Note

Do not forget to connect connector.

5. Closing the back side of chassis.

(1) Insert the center hole of the insulating plate to the boss of the chassis, and fix it using the rubber ring.

- Check that each lever and pin are put into each hole of the insulating plate.

(2) Attach the DPR-62 and SST-3 boards. (Refer to Section 8-2-4 and 8-3.)

6. Cleaning

Clean the capstan motor shaft using a cleaning piece moistened with cleaning fluid.

Adjustment after replacement

7. Servo adjustment (Refer to Section 9-3.)

6-16. CTL Head Replacement

Overviews

Replacement

Entrance head assembly removal
CTL head replacement
Entrance head assembly installation
Entrance head assembly cleaning

Adjustment after replacement

Tape path adjustment

Caution

Never touch the tape cleaner with bare hands. It is danger of cutting your finger because the tape cleaner has a sharp edge.

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)

Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning piece : 2-034-697-00
- Cleaning fluid : 9-919-573-01

Removal

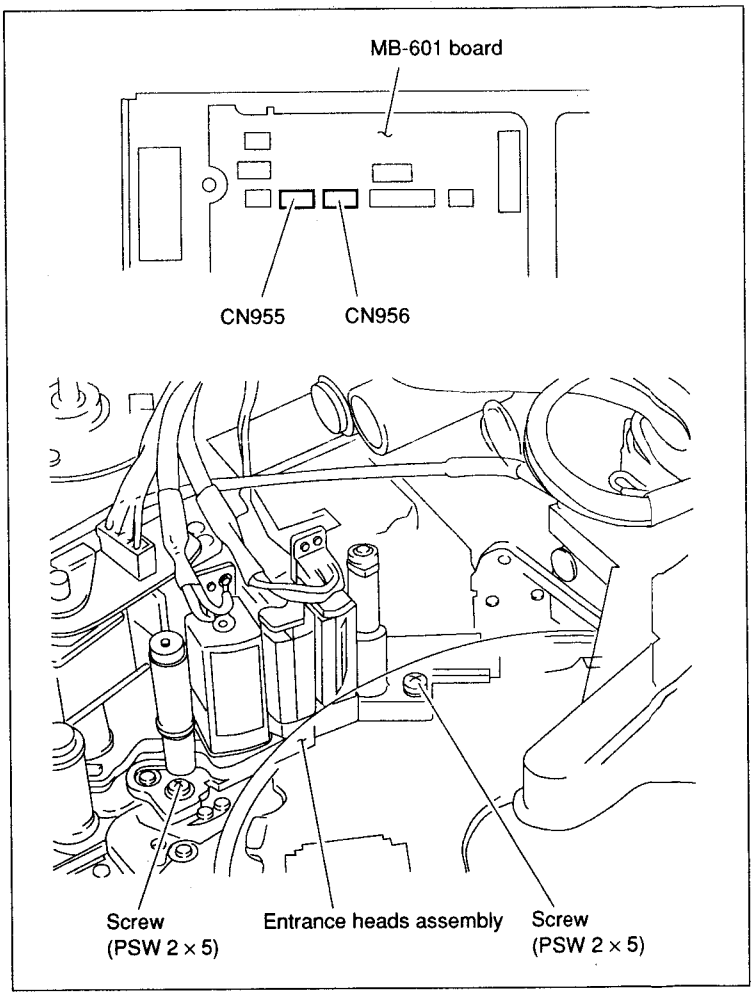
1. Entrance head assembly removal

(1) Disconnect the two connectors CN955 (CTL head) and CN956 (full erase head) on the MB-601 board.

(2) Remove the two screws and the entrance head assembly.

Note

Take care not touch screwdriver against the video head, drum, erase head, tape guide, and other parts.



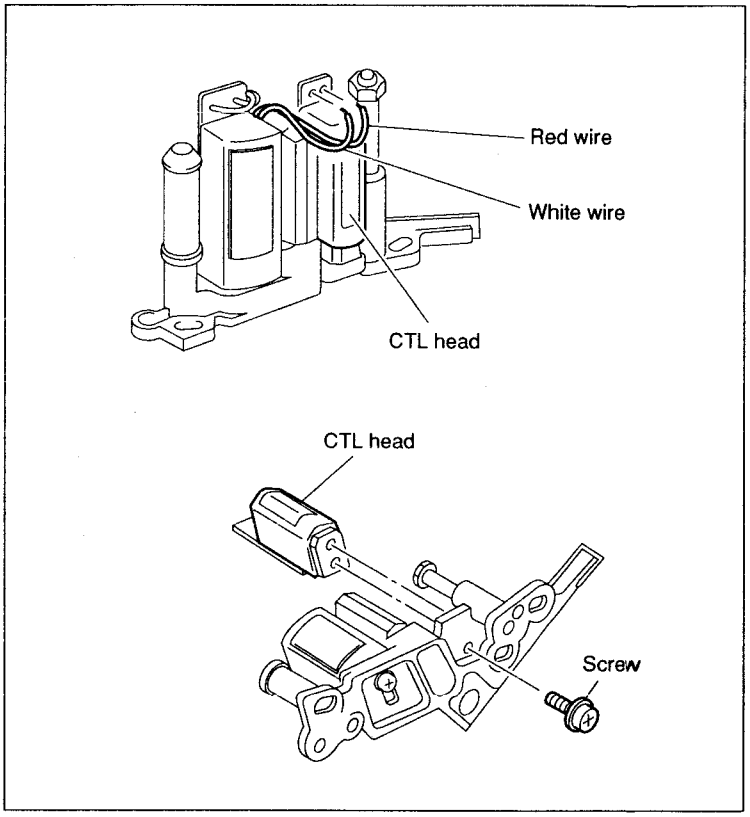
Installation

2. CTL head replacement

(1) Unsolder two leads from the printed circuit board of the CTL head assembly.
(2) Remove the screw at the back side of the entrance head assembly and the CTL head.
(3) Put the boss of the CTL bracket in the hole at the bottom of a new CTL head and tighten the screw.
(4) Solder the two leads to the printed circuit board of the CTL head.

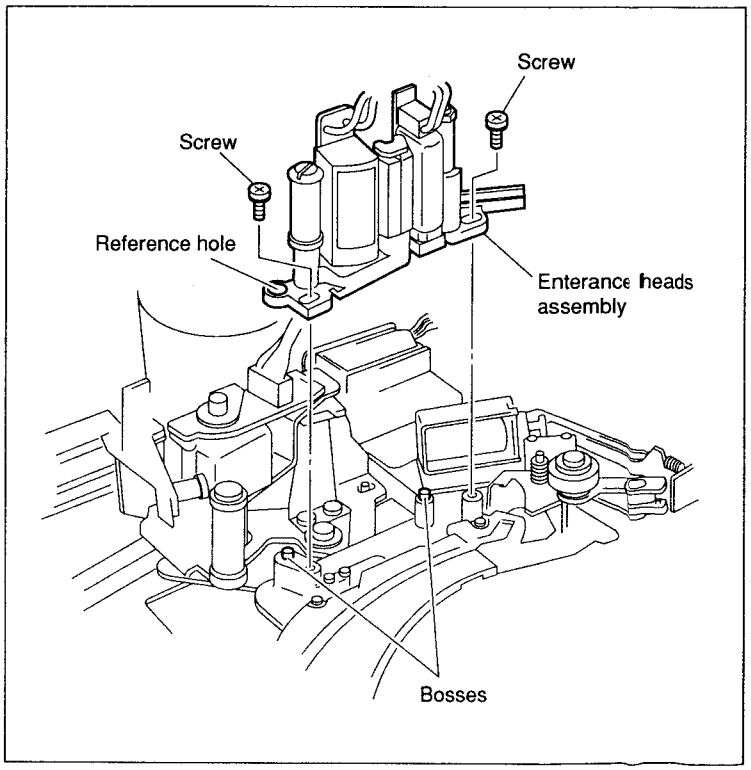
Note

Never mistake the soldering positions. If not, the serious tape interchangeability trouble will occur.



3. Entrance head assembly installation

(1) Put the two bosses of the chassis in the two reference guide holes of the entrance head assembly and tighten the two screws.
(2) Connect the two harness connectors of the entrance head assembly to the connectors CN955 and CN956 on the MB-601 board.



4. Entrance head assembly cleaning

Clean the CTL head, erase head, tape cleaner, and tape guides using a cleaning cloth moistened with cleaning fluid.

Note

- After cleaning, be sure to wipe the relevant area using a dry cleaning cloth.
- Never touch the tape cleaner with bare hands during the tape cleaner cleaning.

Adjustment after replacement

5. Tape path adjustment (Refer to Section 7-1-1.)

6-17. CUE/TC Head Replacement

Overviews

Replacement

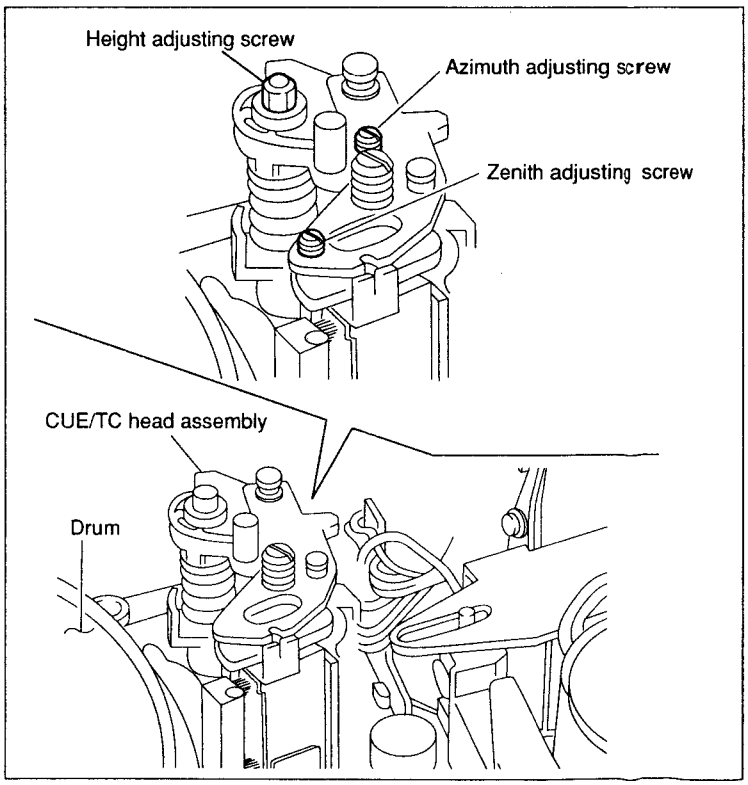
Pinch Solenoid assembly removal
Open the EQ-54 board
Disconnection of connectors
Exit head assembly removal
CUE/TC head replacement
Exit head assembly installation
Operation check
Connection of connectors
EQ-54 board attachment
Pinch solenoid assembly installation
Pinch solenoid assembly position adjustment
Head cleaning

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
CUE/TC head height adjustment
CTL head position adjustment
PG phase adjustment
CUE/TC head position adjustment
Audio adjustment

CAUTION

When replacing, never tighten or loosen other screws except the relevant screws described in the following steps. If tightening or loosening, the azimuth and zenith of the CUE/TC head will change, and serious trouble will occur at the tape path or video tracking adjustments.



Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the cassette compartment. (Refer to Section 1-6.)

Note

Use a harness clamper to arrange the harness of the CUE/TC head assembly and fix them securely. Prepare a new band (3-906-254-01) before replacement.

Tools

- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Pinch solenoid assembly removal

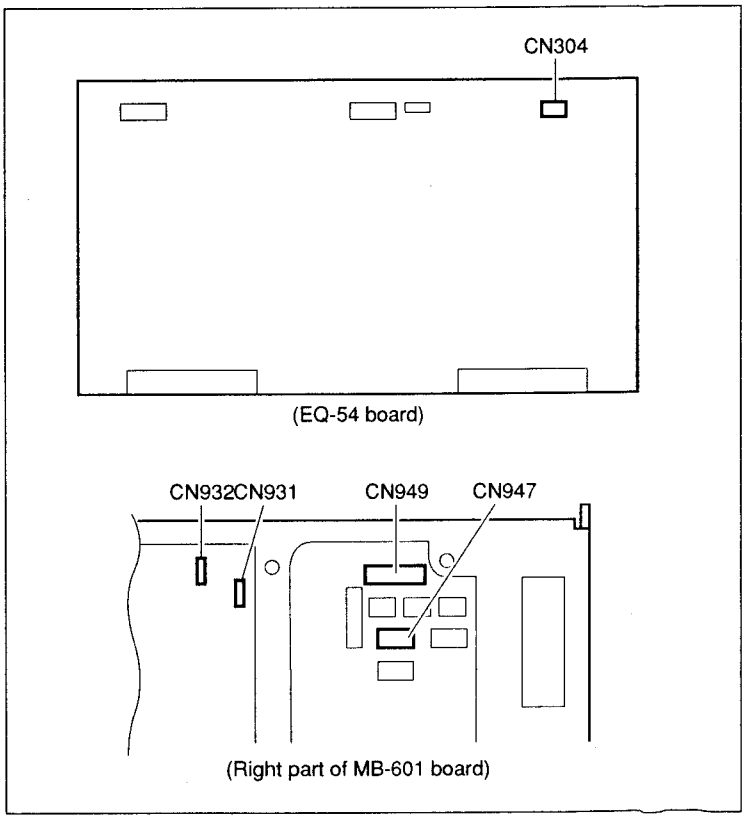
Remove the pinch solenoid assembly. (Refer to Section 6-10.)

2. Open the EQ-54 board

Open the EQ-54 board. (Refer to Section 8-6.)

3. Disconnection of connectors

(1) Disconnect connector CN304 (cue head) on the EQ-54 board.
(2) Disconnect the two connectors CN947 (TC head) and CN949 (cue erase head) on the MB-601 board.
(3) Disconnect the two ground plugs CN931 and CN932 on the MB-601 board.



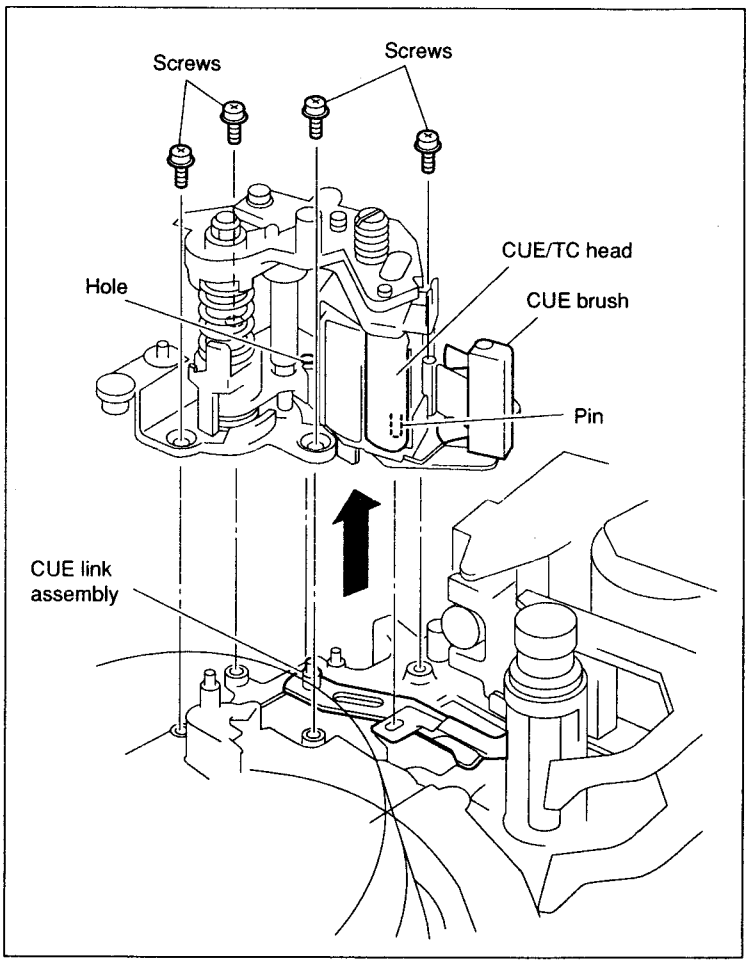
4. Exit head assembly removal

(1) Turn the manual eject gear counterclockwise and put the unit into the unthreading end mode.

(2) Remove the four screws shown in the figure, and remove the exit head assembly from the unit.

Note

Take care not to scratch the drum and other parts.



Installation

5. CUE/TC head replacement

(1) Remove one screw and the harness holder.

(2) Remove the two screws at the top of the CUE/TC head and the CUE/TC head.
In this way, the shielding case and adjustment plate will remove.

Note

Never loosen or tighten the other screws except above mentioned screws.

(3) Unsolder the eight leads on the printed circuit board of the CUE/TC head and solder them to a new head.

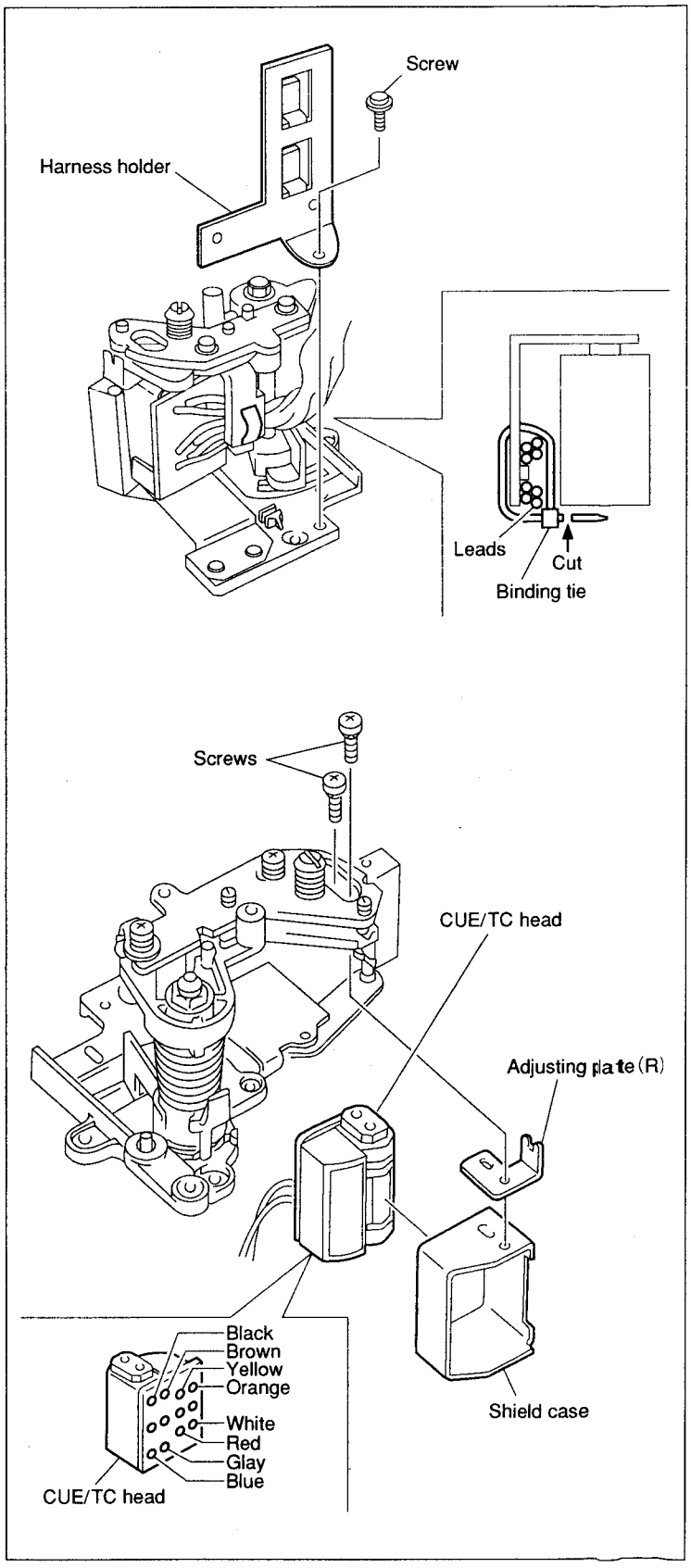
Note

Never mistake the soldering positions.

(4) After putting the CUE/TC head in the shielding case, assemble the parts in the sequence shown in the figure and tighten the with two screws.

(5) Arrange the leads and fix them using a harness clamper.

(6) Put the bottom of the harness holder into the groove of the base shown in the figure and attach it using one screw.



6. Exit head assembly installation

(1) Move the cue brush of the exit head assembly to the position next to the CUE/TC head.

Note

The installation in the next procedure can be then performed easily.

(2) While putting the hole and pin (each one) of the exit head assembly into the pin and hole of the lever on the chassis, put the arm pin of the cue brush into the hole of the lever simultaneously, then install.

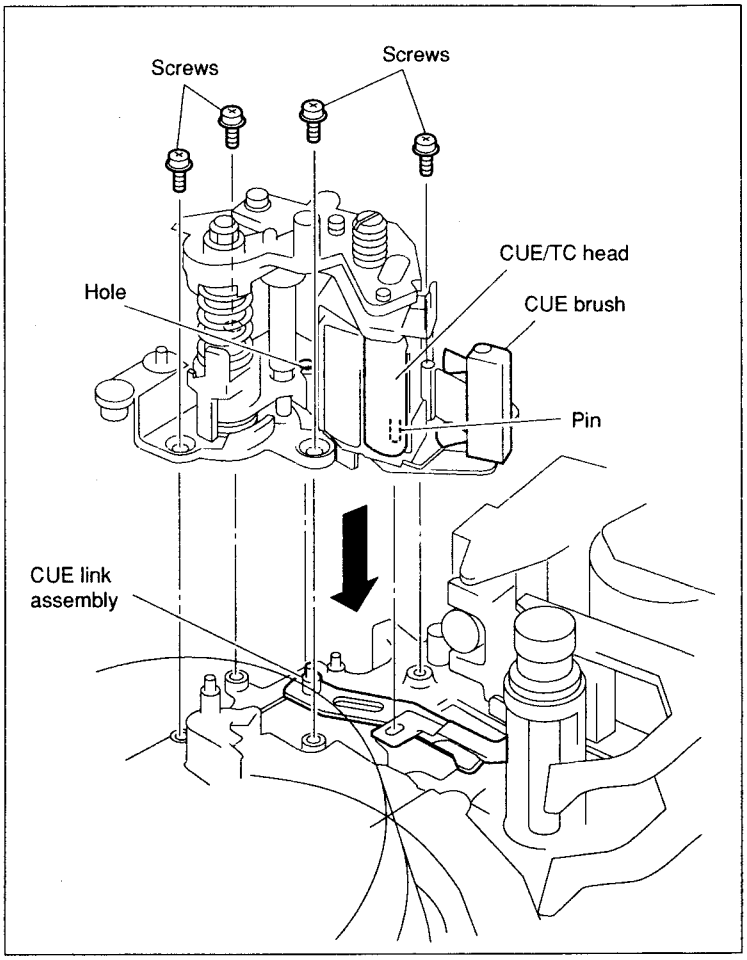
Reference

Turn the manual eject gear slightly clockwise only when the hole and pin are difficult to be installed.

(3) Attach the exit head assembly using four screws.

Note

Be careful not to damage the drum during exit head assembly installation.



7. Operation check

Turn the manual eject gear clockwise and check that the cue brush, CUE/TC head, and pinch lever operate smoothly.

8. Connection of connectors

Connect the harness connectors to the following connectors on the MB-601 board.

- CN931: Ground plug
- CN932: Ground plug
- CN947: Harness connector of TC head
- CN949: Harness connector of CUE/TC erase head

Connect a harness connector to the following connector on the EQ-54 board.

- CN304: Harness connector of CUE head

9. EQ-54 board attachment

Close and attach the EQ-54 board. (Refer to Section 8-6.)

10. Pinch solenoid assembly installation

Attach the pinch solenoid assembly. (Refer to Section 6-10.)

11. Pinch solenoid assembly position adjustment

Adjust the position of the pinch solenoid assembly. (Refer to Section 6-10.)

12. Head cleaning

Clean the CUE/TC head using a cleaning cloth moistened with cleaning fluid.

Note

After cleaning, be sure to wipe the CUE/TC head using a dry cleaning cloth.

Adjustment after replacement

13. Tape path adjustment (Refer to Section 7-1-1.)

14. Audio adjustment (Refer to Section 9-4.)

6-18. Threading Motor Replacement

Overviews

Manual eject assembly removal
Lid opener assembly removal
Gear block assembly removal
Threading motor replacement
Gear block assembly installation
Lid opener assembly installation
Manual eject assembly installation
Manual eject assembly position adjustment
Operation check

Preparations

1. Put the unit into the unthreading end mode.
2. Turn off the power.
3. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the cassette compartment. (Refer to Section 1-6.)

Note

Two types of pinion gears are press-fitted in the threading motor shaft. When replacing, prepare new pinion gears (P/N 3-679-748-01 and P/N 3-680-988-01). Never reuse the two pinion gears.

Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Wire clearance gauge : J-6152-450-A

Removal

1. Manual eject assembly removal

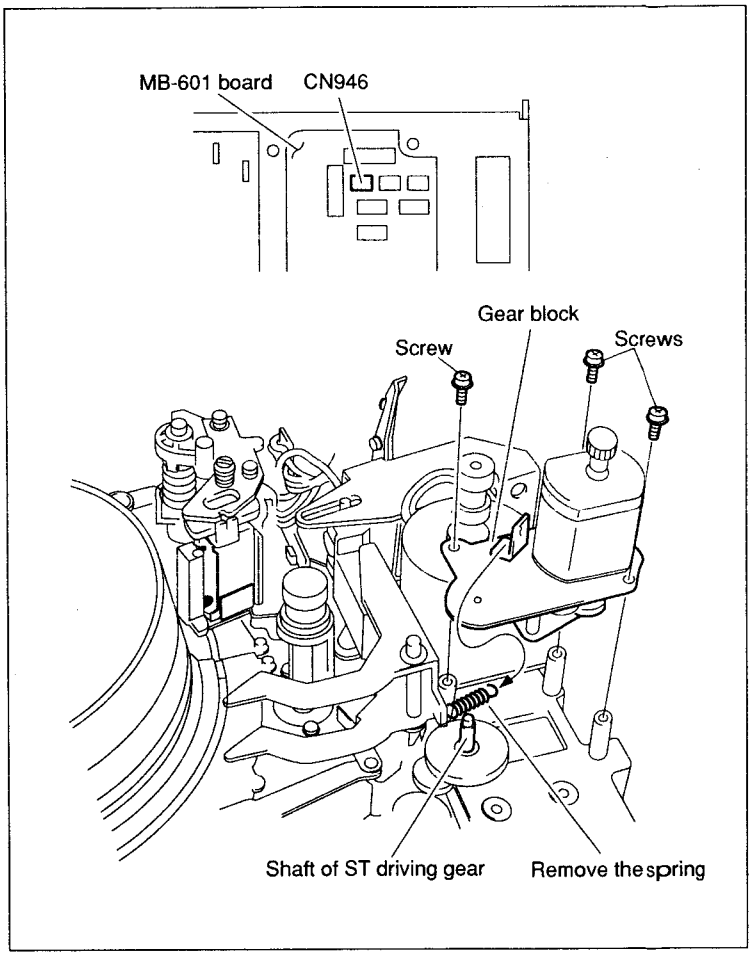
Remove the manual eject assembly. (Refer to "6-13. T Reel Brake Solenoid Replacement".)

2. Lid opener assembly removal

(1) Disconnect the connector CN944 on the MB-601 board.
(2) Remove the two screws and the lid opener assembly.

3. Gear block assembly removal

(1) Disconnect the connector CN946 (threading motor) on the MB-601 board.
(2) Remove the spring attached at the top of the gear block assembly.
(The other hook of the spring remains to the pinch lever.)
(3) Remove the three screws and the gear block assembly.



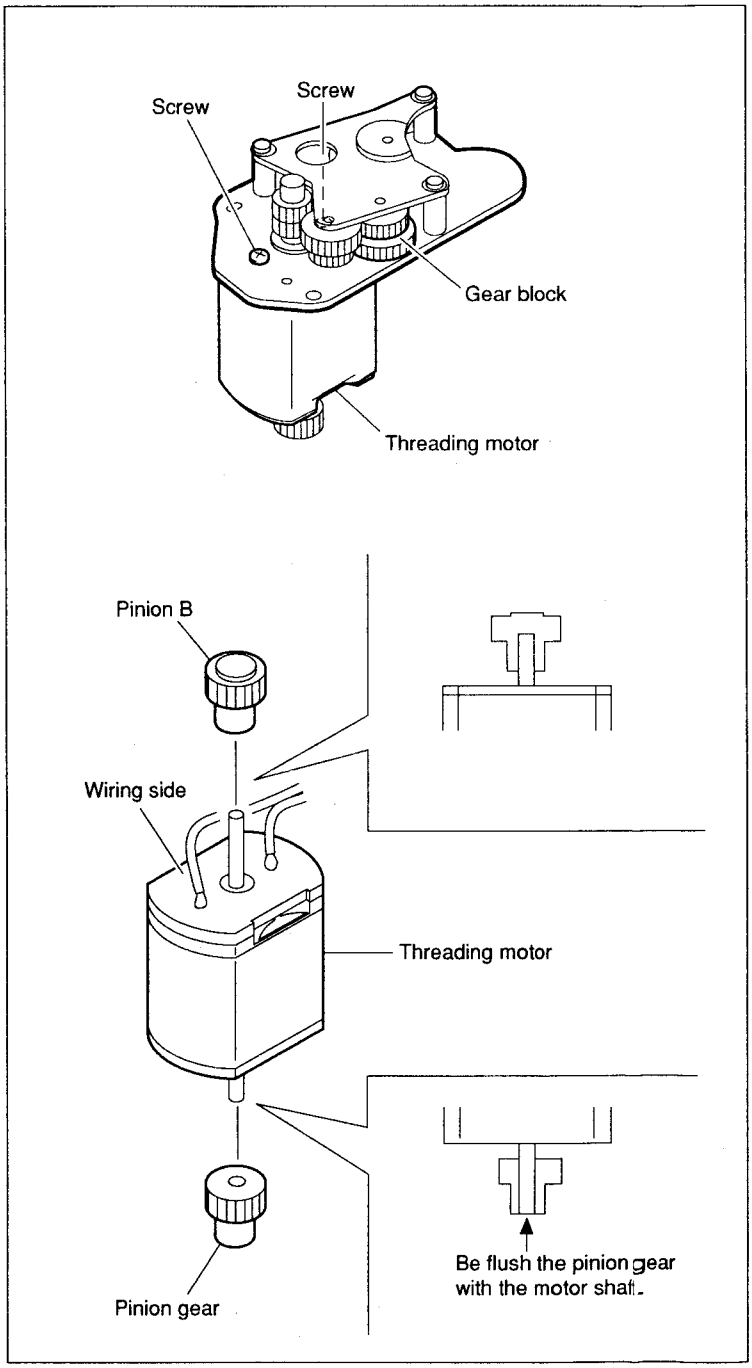
Installation

4. Threading motor replacement

(1) Remove the two screws and the threading motor from the gear block assembly.

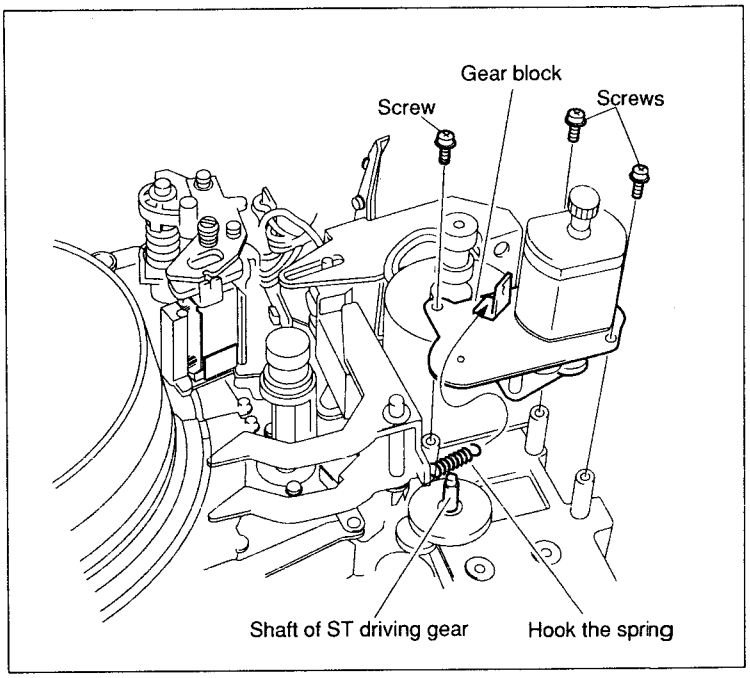
(2) Press the two new pinion gears in the shaft of a new threading motor.
- Press a new pinion gear B (P/N 3-680-988-01) to the shaft on the terminal side.
- Press a new pinion gear (P/N 3-679-748-01) in the other side of the shaft so that the tip of the shaft is the same as the surface of the pinion gear.

(3) Attach the threading motor in the gear block assembly using the two screws.



5. Gear block assembly installation

(1) Place a new gear block assembly on the chassis while inserting the tip of the ST drive gear shaft of the chassis into the hole of the gear block assembly.
(2) Attach the gear block assembly using the three screws.
(3) Put the spring removed in step (2) of 3 on the hook of the gear block assembly.
(4) Connect the harness connector of the gear block assembly to connector CN946 on the MB-601 board.



6. Lid opener assembly installation

(1) Attach the lid opener assembly using the two screws.
(2) Connect the harness connector of the lid opener assembly to connector CN944 on the MB-601 board.

7. Manual eject assembly installation

Attach the manual eject assembly. (Refer to "6-13. T Reel Brake Solenoid Replacement".)

8. Manual eject assembly position adjustment

Adjust the position of the manual eject assembly. (Refer to "6-13. T Reel Brake Solenoid Replacement".)

9. Operation check

Check that the cue cleaner and S and T sliders smoothly operate when the manual eject gear is turned clockwise and counterclockwise while it is pushed downward.

6-19. Battery Replacement

The set data in the setup menu is returned to the factory-setting value when the battery is replaced. To maintain the set data, use the SAVE command in the ISR menu.

Overviews

Opening the back side of chassis
Battery replacement
Closing the back side of chassis

Preparations

(1) Put the unit into the unthreading end mode.
(2) Turn off the power.
(3) Remove the bottom plate. (Refer to "1-5. Removal/Installation of Cabinet".)

Removal

1. Opening the back side of chassis

(1) Disconnect the connectors CN209 and CN210 on the VPR-12 board.
(2) Remove the DPR-62 board. (Refer to Section 8-2-4.)
(3) Disconnect all the connectors on the SST-3 board.
(4) Open the SST-3 board.

Installation

2. Battery replacement

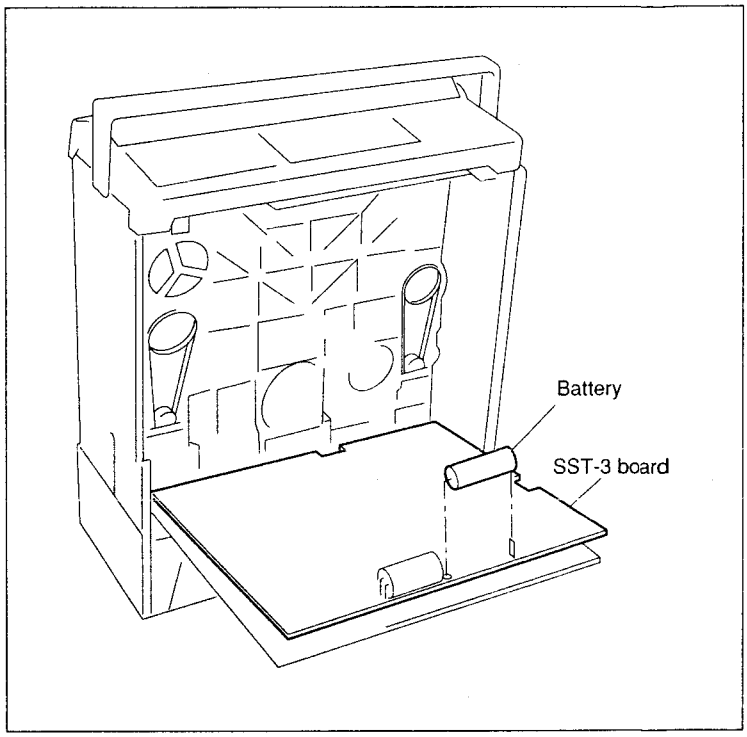
(1) Remove the fastener fixing the battery using nippers.
(2) Desolder the battery terminals on the SST-3 board, and remove the battery.
(3) Solder a new battery to the SST-3 board.
(4) Fix the battery to the SST-3 board with a new fastener.

Note

Never protrude a knot from the outside of the board.

3. Closing the back side of chassis

(1) Close the SST-3 board. (Refer to Section 8-3.)
(2) Connect the harness connectors disconnected in step 1) to the SST-3 board.
(3) Close the DPR-62 board.
(4) Connect the harness connectors to the connectors CN209 and CN210 on the VPR-12 board.
(5) Close the back side of the chassis.



6-20. Cassette Compartment Harness Replacement

Overviews

Disconnection of connector on CS-25 board
Disconnection of connector on CS-26 board
Harness connection
CS-25 board installation

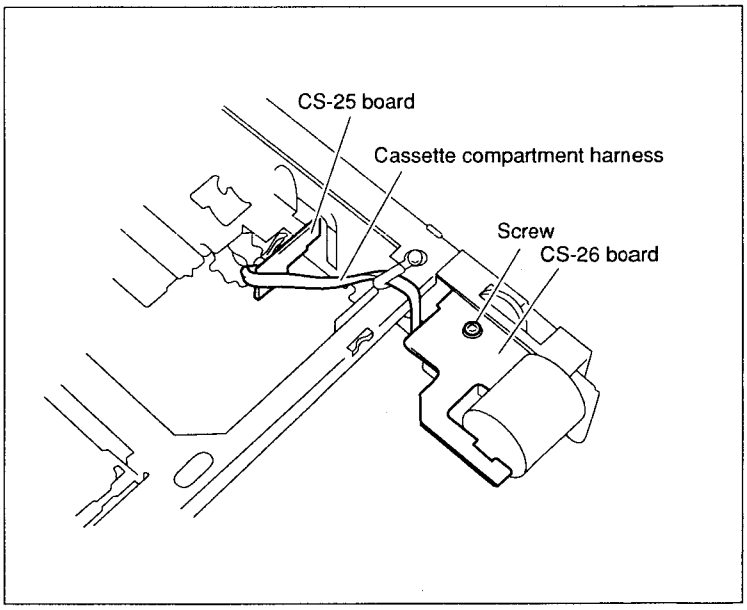
Preparation

1. Remove the cassette compartment. (Refer to Section 1-6.)

Removal

1. Disconnection of connector on CS-25 board

(1) Remove one screw, and remove the CS-25 board from the cassette compartment.
(2) Clutch the hook of the harness clamper using a pair of pliers and remove it from the board.
(3) Disconnect the connector connected to the CS-25 board.



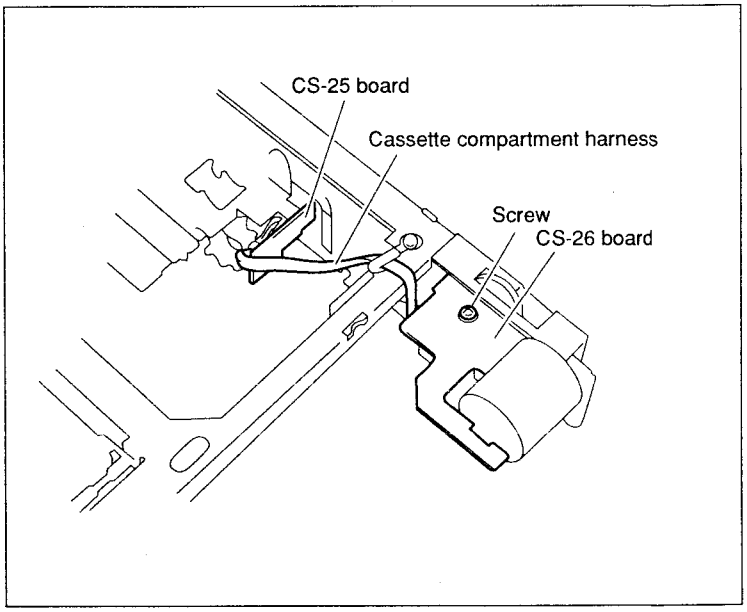
2. Disconnection of connector on CS-26 board

(1) Unhold the harness clamper shown in the figure and cancel the holding of the harness.
(2) Disconnect the connector connected to the CS-26 board.

Installation

3. Harness connection

(1) Connect a new harness to the connector on the CS-26 board.
(2) Pass the harness through the top of the bracket and hold the harness securely using the harness clamper while pulling it gently toward the opposite side of the motor.
(3) Connect the harness connector to the connector on the CS-25 board.
(4) Fix the harness securely to the board using the harness clamper removed in step 1) while removing the harness slacking.



4. CS-25 board installation

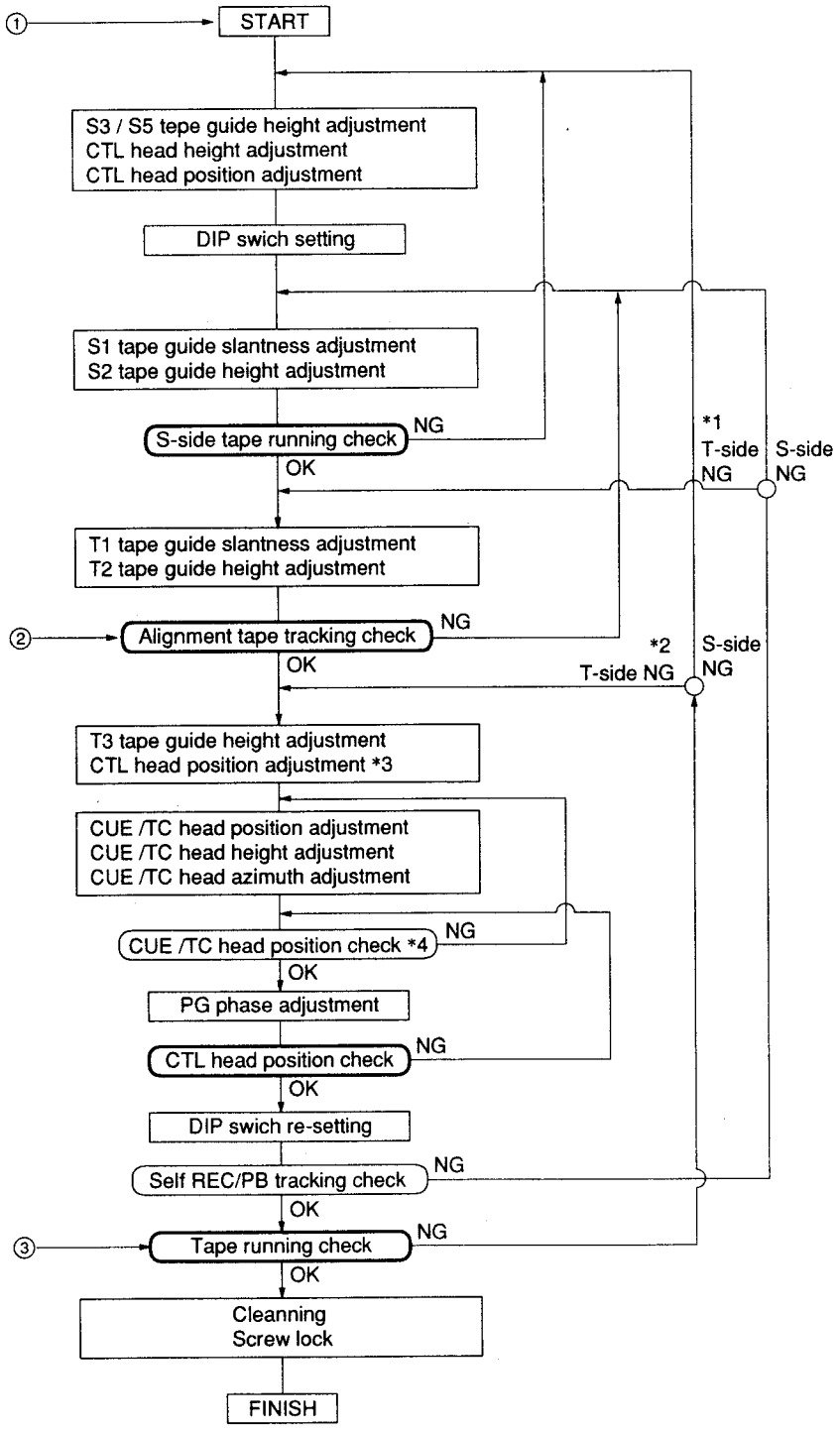
Attach the CS-25 board on the cassette compartment.

Section 7.
Tape Path Alignment

7-1. General Information for Tape Path Adjustment

7-1-1. Tape Path Adjustment Flow

Perform the tape path adjustment of DVW-250/250P as following flow chart.



Referrence :

① • Upper Drum Replacement
• Drum Replacement
• Tension Regulator Roller Replacement
• CTL Head Replacement

*1
S-side NG: The rising edge of the waveform is no good.
T-side NG: The falling edge of the waveform is no good.

*2
S-side NG: Tape path does not meet the S-side or S and T side specifcation.
T-side NG: Tape path does not meet the T-side specifcation.

*3
"CTL head position adjustment"
→ Section 7-2-3.

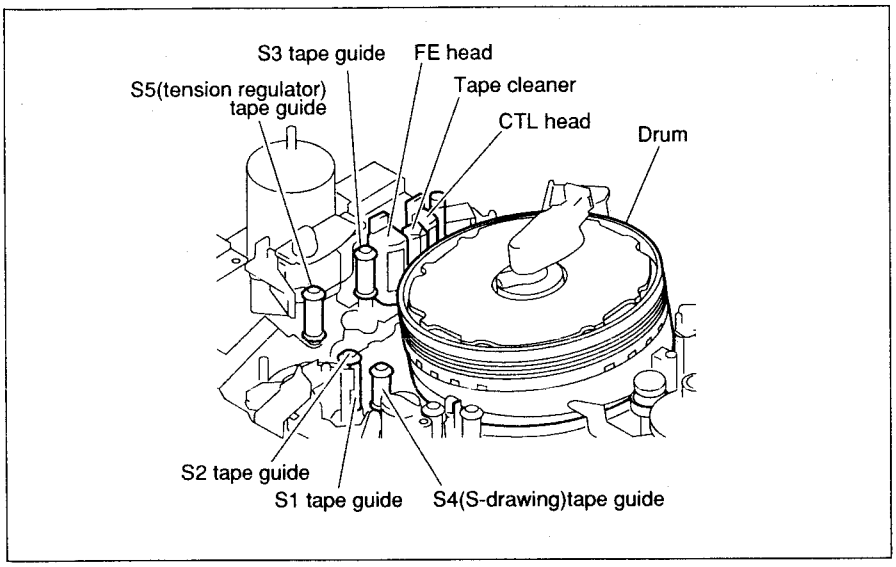
② • CUE/TC Head Replacement

*4
Do the check part of Section 7-2-2.

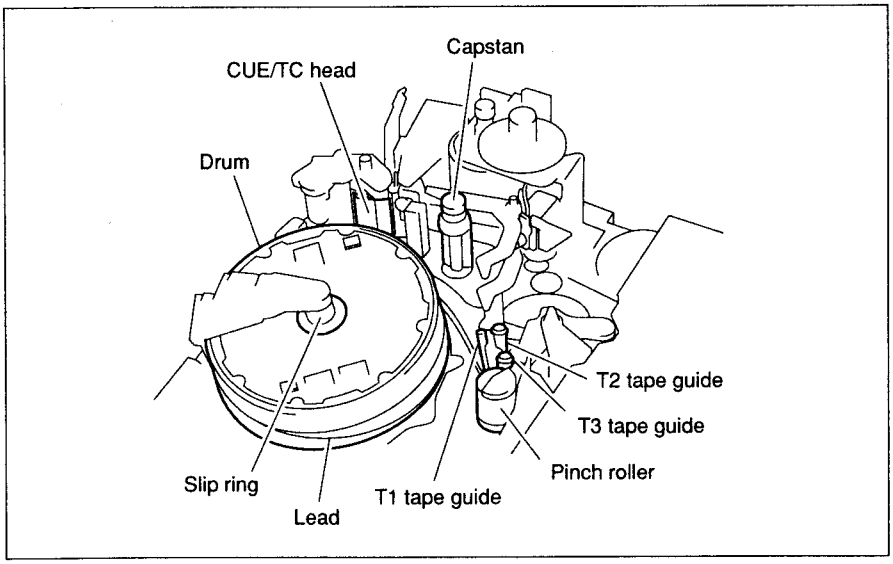
③ • Pinch Roller Replacement
• Pinch Solenoid Replacement
• T Reel Brake Solenoid Replacement

7-1-2. Locations of Tape Running System

Drum entrance side (Unthreading end mode)



Drum exit side (Unthreading end mode)

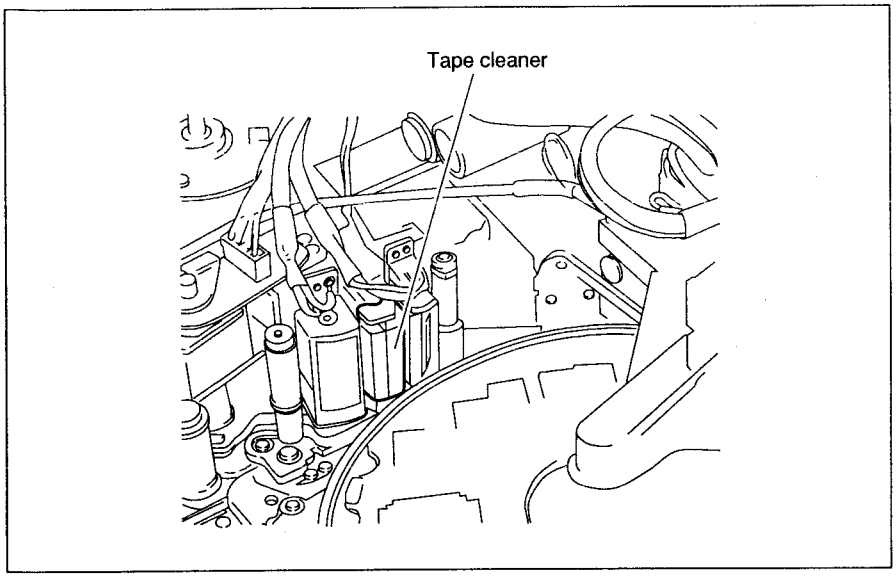


7-1-3. Notes

• About tape cleaner

CAUTION

Never touch the tape cleaner installed at the entrance head assembly with bare hands. It is danger of cutting your finger because the tape cleaner has a sharp edge. When cleaning the tape cleaner, take care it.



• About S4 Guide

S4 guide is a reference guide of tape running system. Never change the height of this tape guide.

• About tape running adjustment

When carrying out the tape running adjustment after replacing the part of the tape path system.
First carry out the checks and adjustments of the tape running using a Digital Betacam cassette tape BCT-D40 or etc.
Next carry out the checks and fine adjustments of the tape running using an alignment tape ZR2-1/P.

• About screws at the top of the tape guides.

Tighten the screws at the top of the tape guides to the following tightening torque.
9×10^{-2} N • m (0.9 kgf • cm)

7-1-4. Preparations

Before adjustments in this section, perform as follows.

(1) Turn the power off.
(2) Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
(3) Clean the following places using a cleaning piece moistened with cleaning fluid. (Refer to "5-1. Cleaning".)
- Video head
- Tape running surface of upper drum
- Tape running surface and lead of the lower drum
- Stationary heads
- Tape cleaner
- All tape guides
- Capstan shaft
- Pinch roller

7-1-5. Tools

Use the following tools in this section.

• Tape guide adjustment screwdriver	J-6321-500-A
• Tape guide driver spare bit	J-6322-420-3
• Inspection mirror (Small oval type)	J-6080-840-A
• Cleaning piece	2-034-697-00
• Cleaning fluid	9-919-573-01
• Torque screwdriver (for 3 kg)	J-6325-400-A
• Torque screwdriver bit (for M2)	J-6325-380-A
• Torque screwdriver hex. bit (across 1.27 mm)	J-7031-460-A
• Alignment tape ZR2-1	8-960-073-11
• Alignment tape ZR2-1P	8-960-073-61

Contents

TIME min.:sec.	CTL TRACK	CUE TRACK	VIDEO/AUDIO TRACK	USE
00 : 00 ↑ (7 : 3 PULSE) ↓ 15 : 00	CTL	1 kHz, 0 VU	4MHz (A CH only)	• Video tracking adustment • CTL head position adustment • CUE head height adustment • CUE/TC head position adustment
20 : 00	CTL	12 kHz, 0 VU	A,C CH-4MHz B,D CH-8MHz	• CUE/TC head azimuth adustment • CUE/TC head head-to-tape contact adustment
25 : 00	CTL	12 kHz, 0 VU	16MHz (ALL CH)	
27 : 00	CTL	———	50% FLAT FIELD (ALL CH)	• PG adustment

* The CTL head height adjustment can use at any position of this alignment tape.

7-2. Tape Path Adjustment

7-2-1. S3/S5 Tape Guides Height Adjustment

Notes

- The following steps using an alignment tape ZR2-1/1P.
  First carry out the checks and adjustments of the tape running using a Digital Betacam cassette tape BCT-D40 or etc.
  Next carry out the checks and fine adjustments of the tape running using an alignment tape ZR2-1/P uses.

Tools

• Tape guide adjustment screwdriver (45)	J-6322-420-A
• Inspection mirror (Small oval type)	J-6080-840-A
• Torque screwdriver (for 3 kg)	J-6325-400-A
• Torque screwdriver bit (for M2)	J-6325-380-A
• Alignment tape ZR2-1	8-960-073-11
• Alignment tape ZR2-1P	8-960-073-61
• Digital Betacam cassette BCT-D124L	Standard product

Checks

1. Play mode (Beginning portion of the tape)

(1) Put into the PLAY mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape running conditions (tape curl and tape contacting flange of tape guide) at S5 guide, S4 guide and S3 guide meet the following specification 1.
If not, perform the adjustment from steps 9) and later.

2. REV SEARCH mode (Beginning portion of the tape)

(1) On the setup menu, set SEARCH speed to ×2. (Refer to Section 3-1.)

(2) Put into the REV SEARCH mode (press the REW button after pressing the SEARCH button) at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(3) Check that the tape runs without any curl at S5 guide, S4 guide and S3 guide.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from steps 9) and later.

3. F FWD mode (Beginning portion of the tape)

(1) Put into the F FWD mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape runs without any curl at S5 guide, S4 guide and S3 guide.
If tape curl occurs by all means, the tape curl shown in the table below is

4. REW mode (Beginning portion of the tape)

(1) Put into the REW mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape runs without any curl at S5 guide, S4 guide and S3 guide. If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from steps 9) and later.

5. Play mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the PLAY mode at the end portion of BCT-D124L.

(2) Check the tape running conditions as the same manner of step (2) in 1.
If not, perform the adjustment from steps 9) and later.

6. REV SEARCH mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the REV SEARCH mode at the end portion of BCT-D124L.

(2) Check the tape curl as the same manner of step (3) in 2.
If not, perform the adjustment from steps 9) and later.

7. F FWD mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the F FWD mode at the end portion of BCT-D124L.

(2) Check the tape curl as the same manner of step (2) in 3.
If not, perform the adjustment from steps 9) and later.

8. REW mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the REW mode at the end portion of BCT-D124L.

(2) Check the tape curl as the same manner of step (2) in 4.
If not, perform the adjustment from steps 9) and later.

Adjustment

9. S3/S5 tape guide height adjustment

Note

If change the height of the S5 guide, push the "STOP " button to stop the tape running before do it.

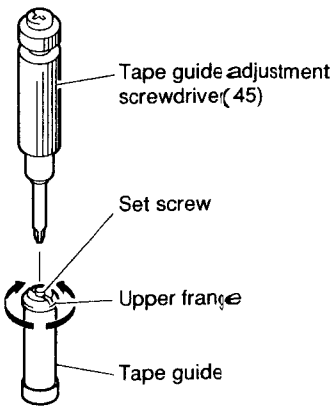
(1) Put into the play back mode at the beginning portion of the ZR2-1/1P (from 5:00 to 10:00).

(2) Loosen the set screws at the top of the S5 guide using the tape guide adjustment screwdriver. Turn the upper flange of the guide, and adjust the height of the guide so that tape runs in contact the lower flange of the S4 guide.

(3) Turn the upper flange of the S5 guide, and adjust the height of the guide so that tape runs in contact the nearer flange (Upper flange in normal condition) of the S5 guide.

(4) Loosen the set screws at the top of the S3 guide using the tape guide adjustment screwdriver. Turn the upper flange of the guide, and adjust the height of the guide so that tape runs in contact the upper flange of the guide.

(5) Put into the REV SEARCH ×2 mode at the beginning portion of the ZR2-1/1P (from 5:00 to 10:00).



(6) Check that the tape runs without any curl at the S3 guide.
If not, turn the upper flange of the S3 guide, and adjust the height of the guide so that tape runs in contact the upper flange of the guide.

(7) Check that the tape runs without any curl at the S5 guide. (acceptable range: less than 1/10 of the tape width)
If not, turn the upper flange of the S5 guide, and adjust the height of the guide so that tape runs near the upper flange of the guide.

(8) Tighten the screws at the top of the tape guides to the following tightening torque.
9×10^{-2} N • m (0.9 kgf • cm)

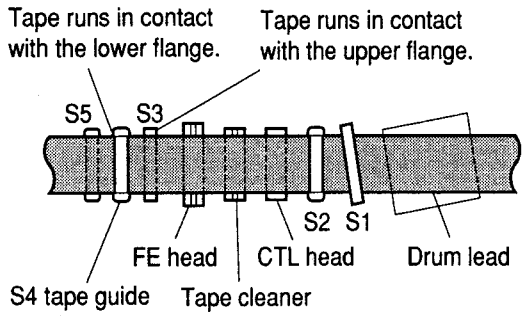
10. Re-check the S3/S5 tape guides

Perform the checks and fine adjustments of the S3 and S5 guides according to step 1 and later.

Specification 1

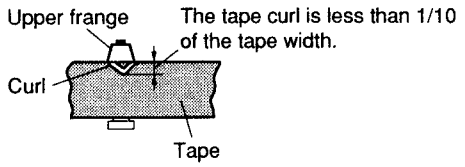
		Guide		
		S5	**S4**	**S3**
PLAY mode	Acceptable range of tape curl	Less than 1/10 of tape width	Less than 1/10 of tape width (*1)	Not acceptable
	Tape contacting flange	Upper (or Lower)	Lower	Upper

*1: Tape curl at the center of tape wrap is not acceptable.



Acceptable range of tape curl

	Guide		
	S5	**S4**	**S3**
Rev ×2 mode F FWD mode REW mode	Less than 1/10 of tape width	Less than 1/10 of tape width	Not acceptable



7-2-2. CTL Head Height Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Nutdriver
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Connect an oscilloscope. CH-1: TP5/MB-601 (CTL) TRIG: TP8/MB-601 (CF)
4. Connect a regulated DC power supply to DC IN connector on the connector panel.
5. Turn the power on.
6. Insert an alignment tape ZR2-1/1P.

Checks

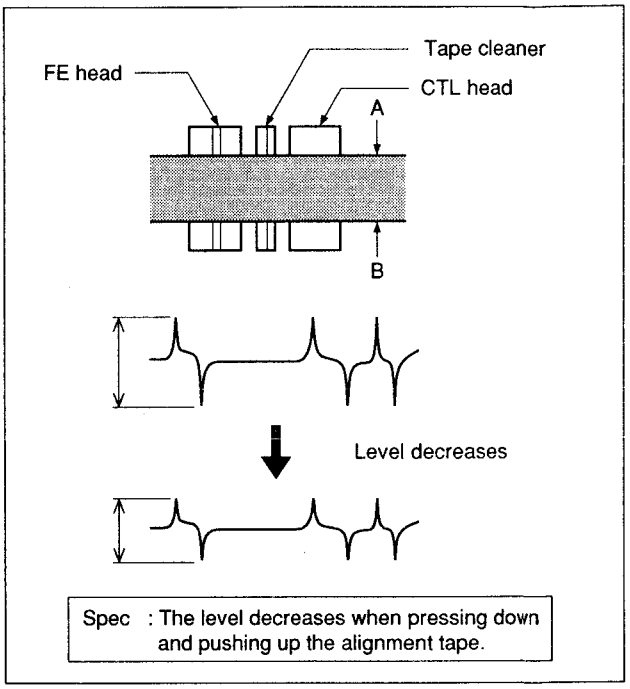
1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P in any portion.

2. CTL head height check

(1) When pressing down the portion A of the tape shown in the figure, check that the level decreases.
If the level increases, perform step 3).

(2) When pushing up the portion B, check that the level decreases.
If the level increases, perform step 4).



Spec : The level decreases when pressing down and pushing up the alignment tape.

Adjustments

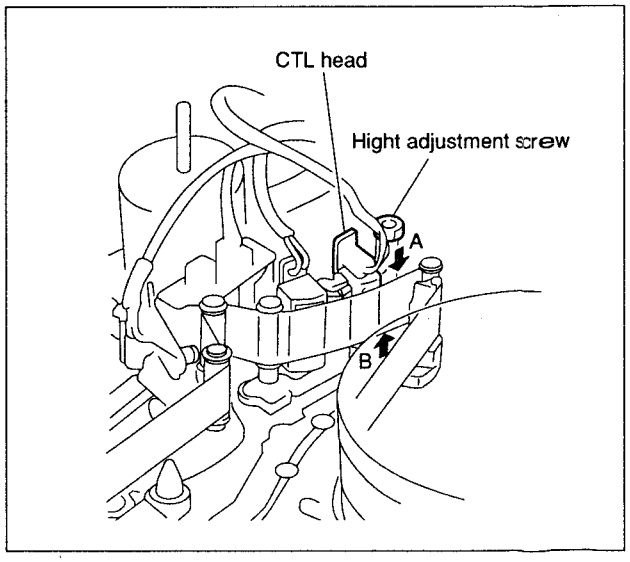
3. If the level increases when pressing down the tape

(1) Turn the height adjusting nut counterclockwise until the output waveform is beyond the maximum.

(2) Turn the height adjusting nut clockwise, and adjust so that the output waveform is the maximum.

4. If the level increases when pushing up the tape

Turn the height adjusting nut clockwise, and adjust so that the output waveform is the maximum.



7-2-3. CTL Head Position Adjustment

Notes

- The CTL head position adjustment is closely related to the CUE/TC head position adjustment. After performing the CTL head position adjustment, be sure to perform the CUE/TC head position check.

Tools

• Alignment tape ZR2-1	8-960-073-11
• Alignment tape ZR2-1P	8-960-073-61
• Torque screwdriver bit (for M2)	J-6325-380-A
• Torque screwdriver (for 3 kg)	J-6325-400-A
• Oscilloscope	
• Regulated DC power supply (AC-550/550CE or equivalent)	

Setting

1. Turn the power off.
2. Remove the top panel.
   (Refer to "1-5. Removal/Installation of Cabinet".)
3. Remove the battery case.
   (Refer to "1-5. Removal/Installation of Cabinet".)
4. Open the ornamental plate on the left side panel.
   (Refer to "1-13. Tracking Adjustment".)
5. Set all four switches of DIP switches S1 and S2 on the UDR-9 board which attaches to the upper drum to ON.
6. Set the switch S700-1 on the EQ-54 board to ON.
7. Connect an oscilloscope.
   CH-1: TP10/MB-601 (REC A)
   CH-2: TP5/MB-601 (CTL)
   TRIG: TP8/MB-601 (CF)
8. Connect a regulated DC power supply to DC IN connector on the connector panel.
9. Turn the power on.
10. On the setup menu, set AUTO TRACKING to OFF.
11. Insert an alignment tape ZR2-1/1P.

Checks

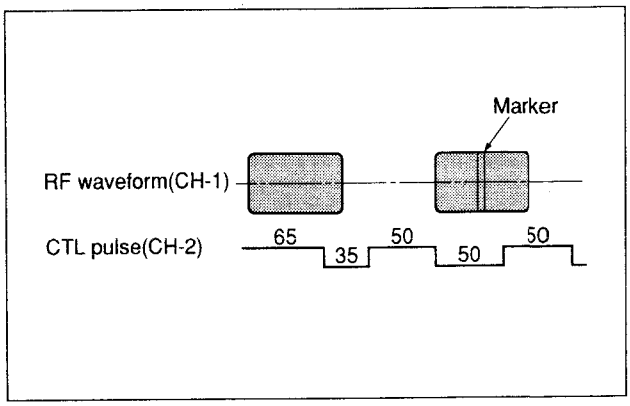
1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (from 00:00 to 15:00).

2. CTL head position check

(1) Turn the tracking control volume using a screwdriver so that the output level at the center of the RF waveform is the maximum. Check that the marker of the RF waveform is output during the low level of the CTL PULSE.

(2) Turn the tracking control volume to center click position. Check that the output level of the RF waveform with the marker does not change and as same as the level of the step (1).
If not, perform step 3) and later.



Adjustments

3. CTL head position adjustment

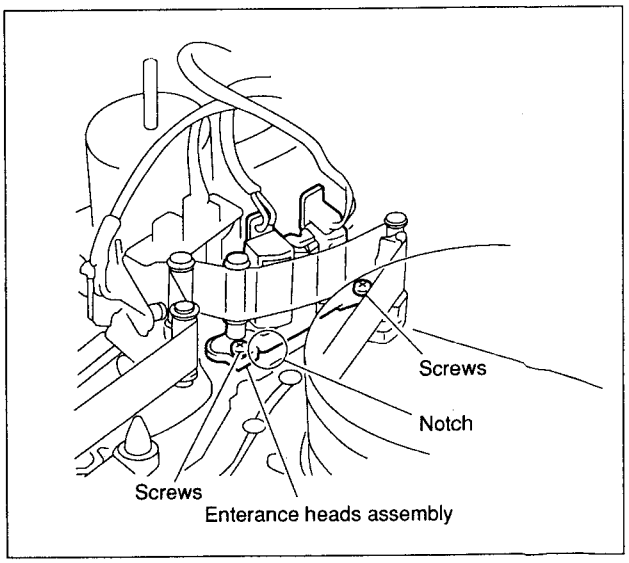
(1) Turn the tracking control volume to center click position.

(2) Turn the two screws which secure the entrance head assembly 1/4 to 1/2 turn.

(3) Put the (–) 3 mm screwdriver in the notch of the entrance head assembly.

(4) Turn the screwdriver and adjust the CTL head position so that the marker of the RF waveform is output during the low level at the CTL PULSE, and the output level at the center of the RF waveform is the maximum.

(5) While holding the screwdriver in the step (4), tighten the two screws.



4. CTL head position re-check

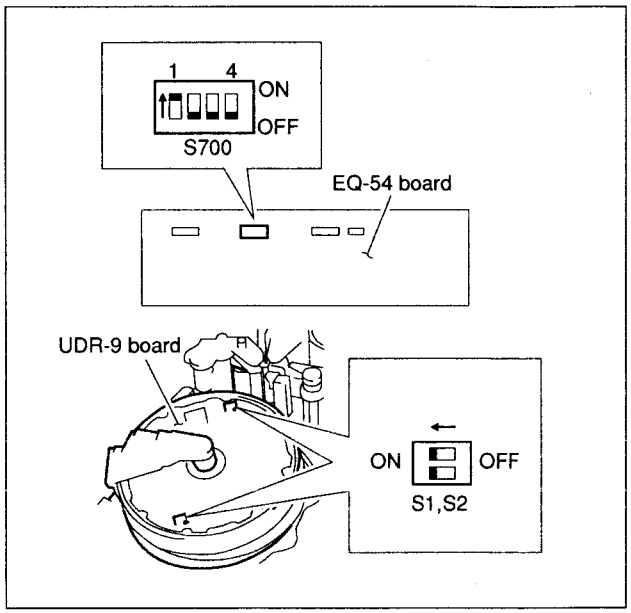
Re-check the CTL head position according to steps 1) and 2).

Note

- After adjustment, set the switch S700-1 on the EQ-54 board to OFF.
- On the setup menu, set AUTO TRACKING to first state (OFF or ON).

7-2-4. DIP Switch Setting

1. Turn the power off.
2. Set all four switches of DIP switches S1 and S2 on the UDR-9 board which attaches to the upper drum to ON.
3. Set switch S700-1 on the EQ-54 board to ON.
4. Turn the power on.



7-2-5. S1 Guide Slantness Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Torque screwdriver (for 3 kg) J-6325-400-A
- Torque screwdriver's hex. bit (across 1.27 mm) J-7031-460-A
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Remove the battery case. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Connect an oscilloscope. CH-1 : TP10/MB-601 (REC A) TRIG : TP8/MB-601 (CF)
5. Connect a regulated DC power supply to DC IN connector on the connector panel.
6. Set all four switches of DIP switches S1 and S2 on the UDR-9 board which attaches to the upper drum to ON.
7. Set switch S700-1 on the EQ-54 board to ON.
8. Turn the power on.
9. On the setup menu, set AUTO TRACKING to OFF.
10. Insert an alignment tape ZR2-1/1P.

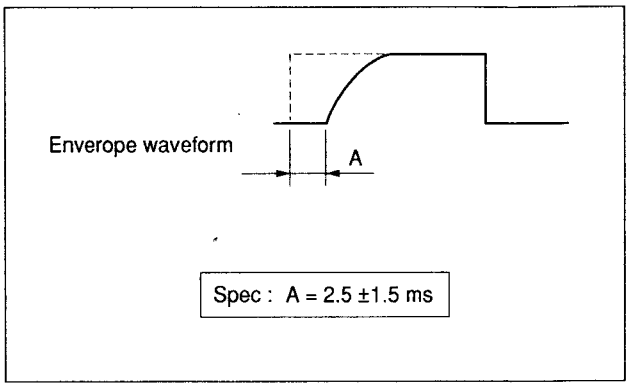
Adjustments

1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (from 00:00 to 15:00).

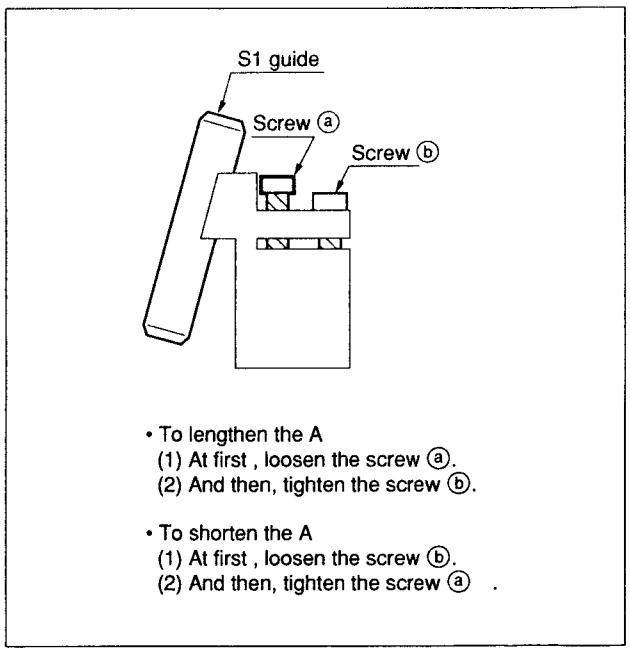
2. S1 guide slantness adjustment

(1) Turn the tracking control volume using a screwdriver so that the output level at the center of the envelope waveform is the maximum.
(2) Turn the upper flange of the S2 guide counterclockwise, and adjust the height so that the tape runs without contacting the upper and lower flanges of the S2 guide.
(3) Adjust the slantness of the S1 guide so that the envelope waveform meets the specification.



Perform the S1 guide slantness adjustment as follows.

(4) Eject the alignment tape and insert it and play back again.
(5) Check that the envelope waveform A meets the specification.
If not, perform the steps (3) and later.
(6) Tighten the set screws ⓐ and ⓑ.
Tightening torque:
0.1 ±0.015 N • m (0.8 ±0.15 kgf • cm)


S1 guide
Screw ⓐ
Screw ⓑ
• To lengthen the A
(1) At first , loosen the screw ⓐ.
(2) And then, tighten the screw ⓑ.
• To shorten the A
(1) At first , loosen the screw ⓑ.
(2) And then, tighten the screw ⓐ .

3. S1 guide slantness check

Repeat the mode change from EJECT mode to PLAY mode 3 times. Check that the envelope waveform A meets the specification.
If not, perform step 1) and later again.

7-2-6. S2 Guide Height Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Torque screwdriver (for 3 kg) J-6325-400-A
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)
- Tape guide adjustment screwdriver

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Remove the ornamental panel on the left side panel. (Refer to "1-13. Tracking Adjustment".)
4. Set all four switches of DIP switches S1 and S2 on the UDR-9 board which attaches to the upper drum to ON.
5. Set the switch S700-1 on the EQ-54 board to ON.
6. Connect an oscilloscope.
   CH-1: TP10/MB-601 (REC A)
   TRIG: TP8/MB-601 (CF)
7. Connect a regulated DC power supply to DC IN connector on the connector panel.
8. Turn the power on.
9. Insert an alignment tape ZR2-1/1P.
10. On the setup menu, set AUTO TRACKING to OFF.

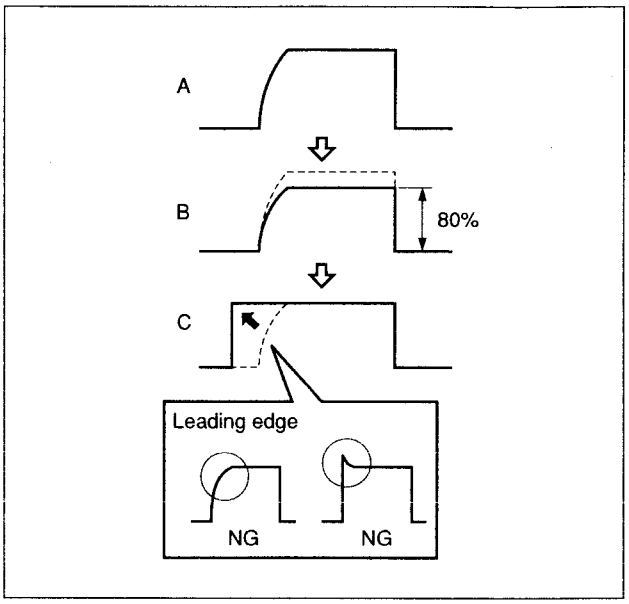
Adjustments

1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (from 00:00 to 15:00).

2. S2 guide height adjustment

(1) Turn the tracking control volume using a screwdriver so that the RF waveform is 80 % of the maximum output (Waveform B shown in figure).
(2) Turn the upper flange of the S2 guide using a tape guide adjustment screwdriver so that the rising edge of the envelop waveform makes flat as shown in figure C.
(3) Check that tape runs in contact with the upper flange of the S2 guide.
(4) Tighten the set screw on the upper flange to the following tightening torque.
Tightening torque: 9×10^{-2} N • m (0.9 kgf • cm)



3. S2 guide height check

Repeat the mode change from EJECT mode to PLAY mode 3 times. Check that the rising edge of the envelop waveform during PLAY mode is the same as the pre-PLAY mode.

7-2-7. S Side Tape Running Check

Tools

- Inspection mirror (Small oval type) J-6080-840-A
- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Digital Betacam cassette BCT-D40 Standard product

Checks

1. Play mode (Beginning portion of the tape)

(1) Put into the PLAY mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape running conditions (tape curl and tape contacting flange of tape guide) at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum meet the following specification 1.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

2. REV SEARCH mode (Beginning portion of the tape)

(1) On the setup menu, set SEARCH speed to ×2.
(Refer to Section 3-1.)

(2) Put into the REV SEARCH mode (press the REW button after pressing the SEARCH button) at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(3) Check that the tape runs without any curl at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

3. F FWD mode (Beginning portion of the tape)

(1) Put into the F FWD mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape runs without any curl at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

4. REW mode (Beginning portion of the tape)

(1) Put into the REW mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape runs without any curl at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

5. Play mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the PLAY mode at the end portion of BCT-D124L.

(2) Check the tape running conditions as the same manner of step (2) in 1.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

6. REV SEARCH mode
(Latter half portion of the tape without last 10 minutes.)

(1) Put into the REV SEARCH mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (3) in 2.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

7. F FWD mode
(Latter half portion of the tape without last 10 minutes.)

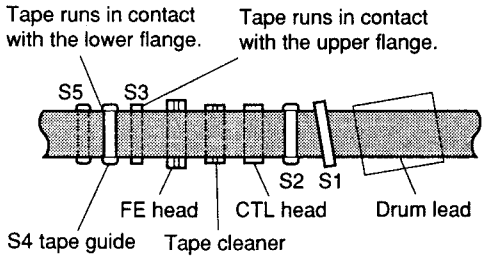
(1) Put into the F FWD mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (2) in 3.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

8. REW mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the REW mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (2) in 4.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

Specification 1

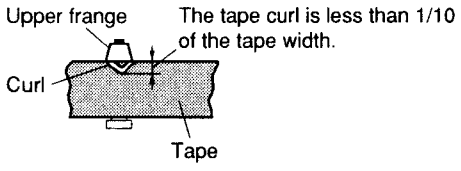
		Guide				Lead of drum
		S5	S4	S3	S2	
PLAY mode	Acceptable range of tape curl	Less than 1/10 of tape width	Less than 1/10 of tape width (*1)	Not acceptable	Less than 1/10 of tape width (*1)	Not acceptable
	Tape contacting flange	Upper (or Lower)	Lower	Upper	Upper	——



Acceptable range of tape curl

	Guide				Lead of drum
	S5	S4	S3	S2	
Rev x2 mode F FWD mode REW mode	Less than 1/10 of tape width	Less than 1/10 of tape width	Not acceptable	Less than 1/10 of tape width (*1)	Less than 1/10 of tape width (*2)

*1: Tape curl at the center of tape wrap is not acceptable.
*2: Tape curl should be disappeared within 1 sec. when the mode change is performed from each mode to PLAY.



7-2-8. T1 Guide Slantness Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Torque screwdriver (for 3 kg) J-6325-400-A
- Torque screwdriver's hex. bit (across 1.27 mm) J-7031-460-A
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Open the ornamental plate on the left side panel. (Refer to "1-13. Tracking Adjustment".)
4. Connect an oscilloscope.
   CH-1 : TP10/MB-601 (REC A)
   TRIG : TP8/MB-601 (CF)
5. Connect a regulated DC power supply to DC IN connector on the connector panel.
6. Turn the power on.
7. On the setup menu, set AUTO TRACKING to OFF.
8. Insert an alignment tape ZR2-1/1P.

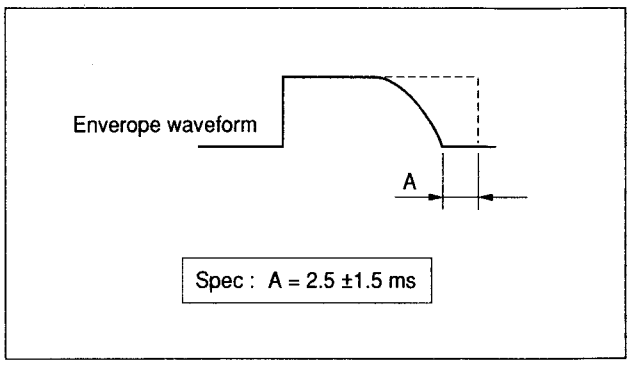
Adjustments

1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (from 00:00 to 15:00).

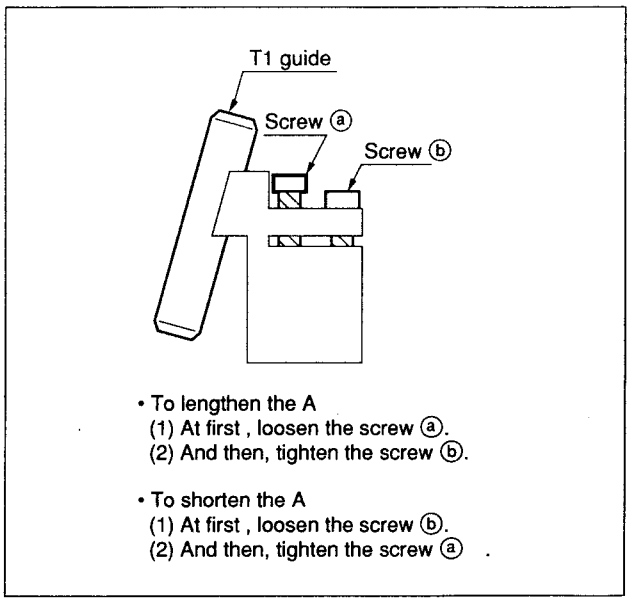
2. T1 guide slantness adjustment

(1) Turn the tracking control volume using a screwdriver so that the output level at the center of the envelope waveform is the maximum.
(2) Turn the upper flange of the T2 guide counterclockwise, and adjust the height so that the tape runs without contacting the upper and lower flanges of the T2 guide.
(3) Adjust the slantness of the T1 guide so that the envelope waveform meets the specification.



Perform the T1 guide slantness adjustment as follows.

(4) Eject the alignment tape and insert it and play back again.
(5) Check that the envelope waveform A meets the specification.
If not, perform the steps (3) and later.
(6) Tighten the set screws ⓐ and ⓑ.
Tightening torque:
0.1 ±0.015 N • m (0.8 ±0.15 kgf•cm)


T1 guide
Screw ⓐ
Screw ⓑ
• To lengthen the A
(1) At first , loosen the screw ⓐ.
(2) And then, tighten the screw ⓑ.
• To shorten the A
(1) At first , loosen the screw ⓑ.
(2) And then, tighten the screw ⓐ .

3. T1 guide slantness check

Repeat the mode change from EJECT mode to PLAY mode 3 times. Check that the envelope waveform A meets the specification.
If not, perform step 1) and later again.

7-2-9. T2 Guide Height Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Torque screwdriver (for 3 kg) J-6325-400-A
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)
- Tape guide adjustment screwdriver

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Open the ornamental panel on the left side panel. (Refer to "1-13. Tracking Adjustment".)
4. Connect an oscilloscope.
   CH-1: TP10/MB-601 (REC A)
   TRIG: TP8/MB-601 (CF)
5. Connect a regulated DC power supply to DC IN connector on the connector panel.
6. Turn the power on.
7. Insert an alignment tape ZR2-1/1P.
8. On the setup menu, set AUTO TRACKING to OFF.

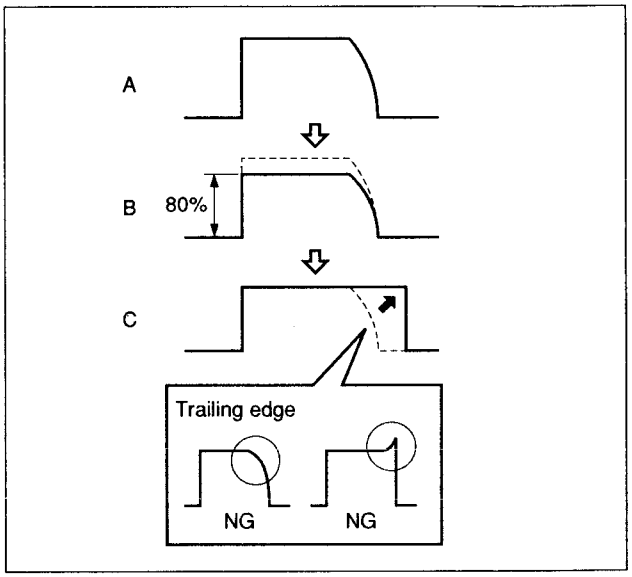
Adjustments

1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (from 00:00 to 15:00).

2. T2 guide height adjustment

(1) Turn the tracking control volume using a screwdriver so that the RF waveform is 80 % of the maximum output,(Waveform B shown in figure).
(2) Turn the upper flange of the T2 guide using a tape guide adjustment screwdriver so that the rising edge of the envelop waveform makes flat as shown in figure C.
(3) Check that tape runs in contact with the upper flange of the T2 guide.
(4) Tighten the set screws on the upper flange to the following tightening torque.
Tightening torque: $9\times10/^{-2}$ N • m (0.9 kgf • cm)



3. T2 guide height check

Repeat the mode change from EJECT mode to PLAY mode 3 times. Check that the rising edge of the envelop waveform during PLAY mode is the same as the pre-PLAY mode.

7-2-10. Alignment Tape Tracking Check

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel.
   (Refer to "1-5. Removal/Installation of Cabinet".)
3. Open the ornamental panel on the left side panel.
   (Refer to "1-13. Tracking Adjustment".)
4. Connect an oscilloscope.
   CH-1: TP10/MB-601 (REC A)
   TRIG: TP8/MB-601 (CF)
5. Connect a regulated DC power supply to DC IN connector on the connector panel.
6. Turn the power on.
7. On the setup menu, set AUTO TRACKING to OFF.
8. Insert an alignment tape ZR2-1/1P.

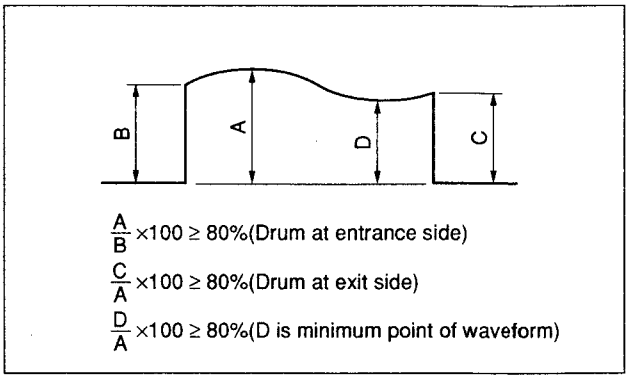
Checks

1. Playback the alignment tape.

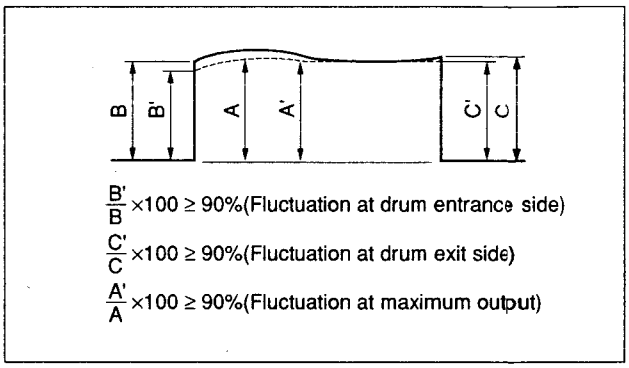
Play back the alignment tape ZR2-1/1P (from 00:00 to 15:00).

2. Tracking check

(1) Turn the tracking control volume using a screwdriver so that the output level at the center of the envelope waveform is the maximum.
(2) Turn the tracking control volume clockwise so that the output level at the center of the envelope waveform is 80 % of the maximum amplitude.
(3) Check that the envelope waveform meets the specification 1.



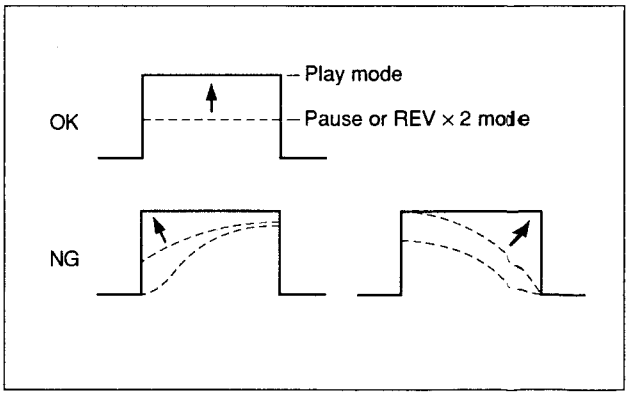
(4) Check that the envelope waveform meets the specification 2.



3. Tracking check in the upright position

(1) Put the unit into the upright position.
(2) Check that the specifications 1 and 2 are met.

If the specification 1 and/or 2 is not met in the steps 2 and 3, perform the adjustment from "7-2-5. S1 Guide Slantness Adjustment" and later again.



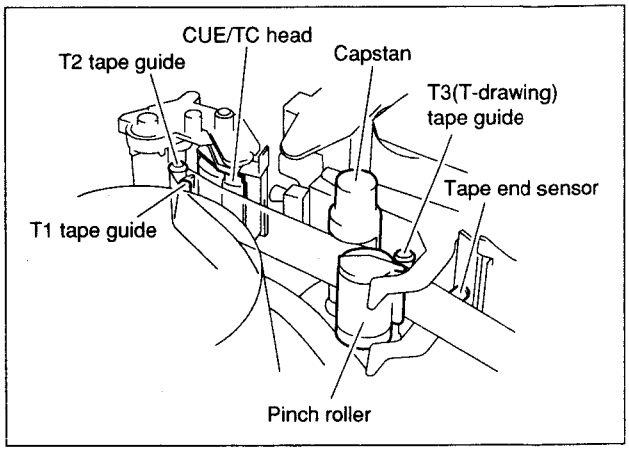
4. Start-up time check

(1) Play back the alignment tape ZR2-1/1P (from 20:00 to 25:00).
(2) Turn the tracking control volume using a screwdriver so that the output level at the center of the envelop waveform is the maximum.
(3) Put the unit into EJECT mode once.
(4) Put the unit into threading mode, and press the PLAY button.
(5) Push the PAUSE button to be pause mode the unit, press the PAUSE button again.
(6) Check that the start-up time of the envelope waveform is within 1 sec likes shown in figure and the tape curl at the lead portion disappears within 0.5 sec.
(7) Put the unit into REV ×2 mode.
After several seconds, put the unit into PLAY mode.
Check that the start-up time of the waveform is within 1 sec likes shown in figure.
(8) Perform steps (4) to (6) three times.

7-2-11. T3 Guide Height Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Digital Betacam cassette BCT-D124L Standard product



Checks

1. Play mode (Beginning portion of the tape)

(1) Put into the PLAY mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)
(2) Check that the tape running conditions (tape curl and tape contacting flange of tape guide) at T3 guide meets the following specification 1.
If not, perform the adjustment from steps 9) and later.

2. REV SEARCH mode (Beginning portion of the tape)

(1) On the setup menu, set SEARCH speed to ×2. (Refer to Section 3-1.)
(2) Put into the REV SEARCH mode (press the REW button after pressing the SEARCH button) at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)
(3) Check that the tape runs without any curl at T3 guide.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from steps 9) and later.

3. F FWD mode (Beginning portion of the tape)

(1) Put into the F FWD mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)
(2) Check that the tape runs without any curl at T3 guide.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from steps 9) and later.

4. REW mode (Beginning portion of the tape)

(1) Put into the REW mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)
(2) Check that the tape runs without any curl at T3 guide.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from steps 9) and later.

5. Play mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the PLAY mode at the end portion of BCT-D124L.
(2) Check the tape running conditions as the same manner of step (2) in 1.
If not, perform the adjustment from steps 9) and later.

6. REV SEARCH mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the REV SEARCH mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (3) in 2.
If not, perform the adjustment from steps 9) and later.

7. F FWD mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the F FWD mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (2) in 3.
If not, perform the adjustment from steps 9) and later.

8. REW mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the REW mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (2) in 4.
If not, perform the adjustment from steps 9) and later.

Adjustments

9. T3 tape guide height adjustment

(1) Put into the play back mode at the end portion of the BCT-D124L.
(2) Loosen the set screws at the top of the T3 guide using the tape guide adjustment screwdriver. Turn the upper flange of the guide, and adjust the height of the guide so that tape runs in contact the lower flange of the guide.
(3) Check that the tape runs without any curl at the T3 guide in REV SEARCH ×2, F FWD and REW mode. (acceptable range: less than 1/10 of the tape width)
If not, turn the upper flange of the T3 guide, and adjust the height of the guide so that tape runs near the upper flange of the guide.
(4) Put into the PLAY mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)
(5) Turn the upper flange of the guide, and adjust the height of the guide so that tape runs in contact the lower flange of the guide.
(6) Check that the tape runs without any curl at the T3 guide in REV SEARCH ×2, F FWD and REW mode. (acceptable range: less than 1/10 of the tape width)
If not, turn the upper flange of the T3 guide, and adjust the height of the guide so that tape runs near the upper flange of the guide.
(7) Tighten the screws at the top of the tape guides to the following tightening torque.
9×10^{-2} N • m (0.9 kgf • cm)

10. Re-check the T3 tape guides

Perform the checks and fine adjustments of the T3 guide according to steps 1) and later.

Specification 1

	Guide
	T3
Acceptable range of tape curl	Less than 1/10 of tape width
Tape contacting flange	Lower (Using BCT-L124L)

Acceptable range of tape curl

	Guide
	T3
Rev ×2 mode F FWD mode REW mode	Less than 1/10 of tape width

7-2-12. CUE/TC Head Position Adjustment

Notes

- Before performing this adjustment, be sure to finish the CTL head position adjustment. The CUE/TC head position adjustment performs as the standard position of the CTL head.
- The CUE/TC head position adjustment closely related to the height, azimuth and head-to-tape contact adjustments of the CUE head.

Tools

• Alignment tape ZR2-1	8-960-073-11
• Alignment tape ZR2-1P	8-960-073-61
• Torque screwdriver bit (for M2)	J-6325-380-A
• Torque screwdriver (for 3 kg)	J-6325-400-A
• Oscilloscope	
• Regulated DC power supply (AC-550/550CE or equivalent)	

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Remove the battery case. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the ornamental plate on the left side panel. (Refer to "1-13. Tracking Adjustment".)
5. Connect an oscilloscope. CH-1: TP5/MB-601 (CTL) CH-2: TP6/MB-601 (TC)
6. Connect a regulated DC power supply to DC IN connector on the connector panel.
7. Turn the power on.
8. On the setup menu, set AUTO TRACKING to OFF.
9. Insert an alignment tape ZR2-1/1P.

Checks

1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (00:00 to 15:00).

2. CUE/TC head position check

(1) Turn the tracking control volume to center click position.
(2) Check that the positional relation of the falling edge of the CTL pulse, and the rising edge of the TC signal meets the specification.
If not, perform the step 3) and later.
(3) Repeat the mode change from EJECT mode to PLAY mode 2 or 3 times.
Check that the waveform meets the specification.
If not, perform the step 3) and later.
(4) Repeat the mode change from REV SEARCH mode to PLAY mode 2 or 3 times.
Check that the waveform meets the specification.
If not, perform the step 3) and later.

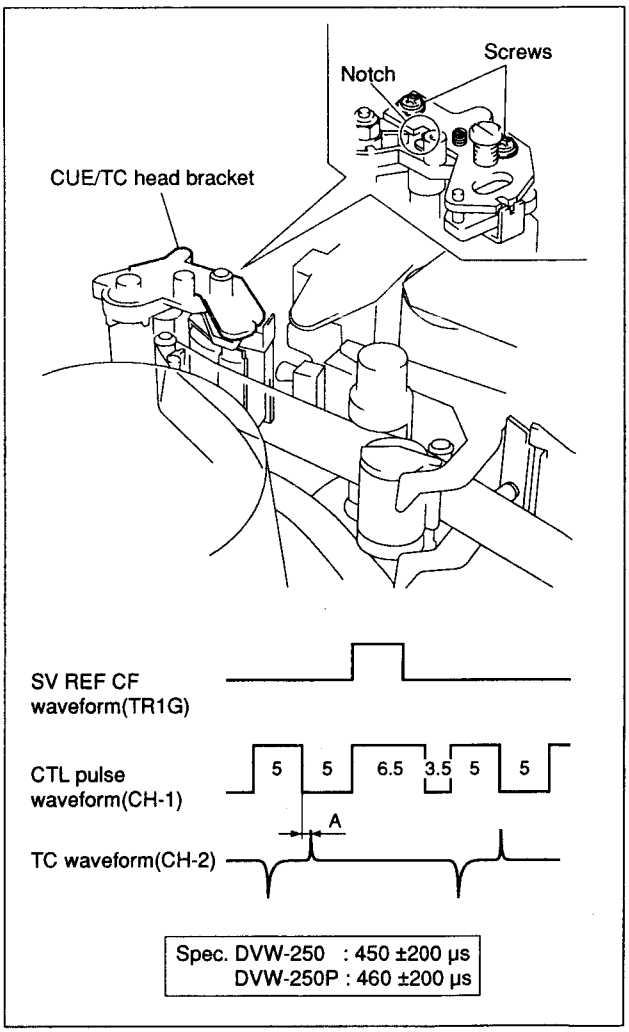
Adjustments

3. CUE/TC head position adjustment

(1) Loosen two screws of the CUE head bracket 1/4 to 1/2 turn.
(2) Put the (–) 3 mm screwdriver in the notch of the CUE head bracket.
(3) Turn the screwdriver and adjust the CUE/TC head position so that the specification is met.
(4) While holding the screwdriver in step (3), tighten the two screws.

4. CUE/TC head position re-check

Re-check according to the check procedures.



7-2-13. CUE/TC Head Height Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Nutdriver
- Oscilloscope
- Regulated DC power supply
  (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel.
   (Refer to "1-5. Removal/Installation of Cabinet".)
3. Remove the battery case.
   (Refer to "1-5. Removal/Installation of Cabinet".)
4. Connect an oscilloscope.
   CH-1: TP802/EQ-54 (CUE PB)
5. Connect a regulated DC power supply to DC IN connector on the connector panel.
6. Turn the power on.
7. On the setup menu, set the SEARCH speed to × 2.
   (Refer to Section 3-1.)
8. Insert an alignment tape ZR2-1/1P.

Checks

1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (00:00 to 15:00).

2. CUE/TC head height check

(1) When pressing down the portion A of the tape shown in the figure, check that the level decreases.
If the level increases, perform steps 3), and 5) and later.

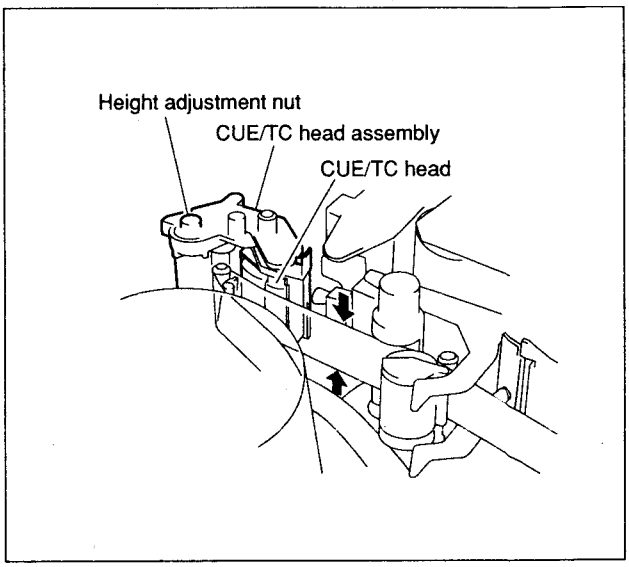
(2) When pushing up the portion B, check that the level decreases.
If the level increases, perform steps 4) and later.

(3) Repeat the mode change from EJECT mode to PLAY mode 2 or 3 times. Check that the output level is same as the pre-PLAY level and does not change.
If the level changes, perform the step 3) and later.

(4) Repeat the mode change from REV SEARCH mode to PLAY mode 2 or 3 times. Check that the output level is same as the pre-PLAY level and does not change.
If the level changes, perform the step 3) and later.Reference

• How to put into the REV SEARCH mode;

Press the REW button after pressing the SEARCH button.



Adjustments

3. If the level increases when pressing down the tape

(1) Turn the height adjusting nut counterclockwise until the output waveform is beyond the maximum.

(2) Turn the height adjusting nut clockwise, and adjust so that the output waveform is the maximum.

4. If the level increases when pushing up the tape

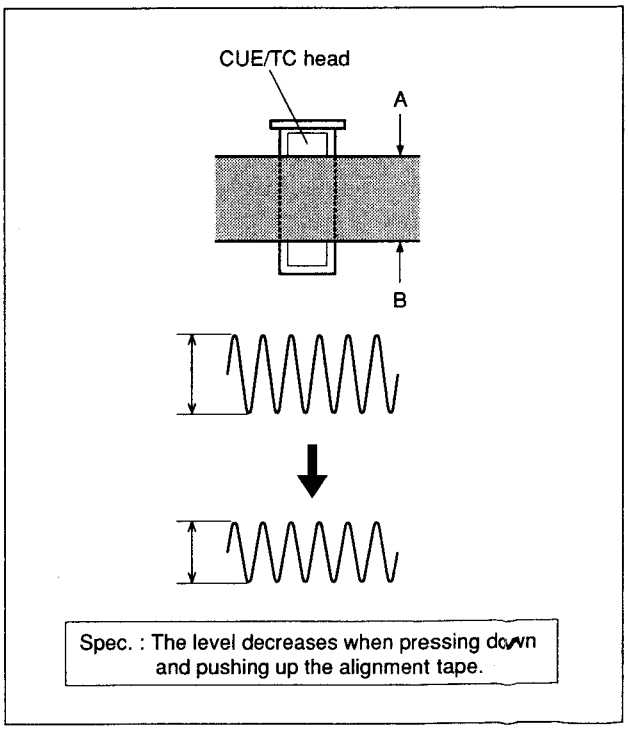
Turn the height adjusting nut clockwise, and adjust so that the output waveform is the maximum.

5. CUE/TC head height check

Check the CUE/TC head height according to the check procedures.

6. SEARCH speed re-setting

On the setup menu, reset SEARCH speed to the former speed.



7-2-14. CUE/TC Head Azimuth Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Remove the battery case. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Connect an oscilloscope. CH-1: TP802/EQ-54 (CUE PB)
5. Connect a regulated DC power supply to DC IN connector on the connector panel.
6. Turn the power on.
7. On the setup menu, set the SEARCH speed to × 2. (Refer to Section 3-1.)
8. Insert an alignment tape ZR2-1/1P.

Adjustments

1. Playback the alignment tape.

Play back the alignment tape ZR2-1/1P (15:00 to 25:00).

2. CUE/TC head azimuth check

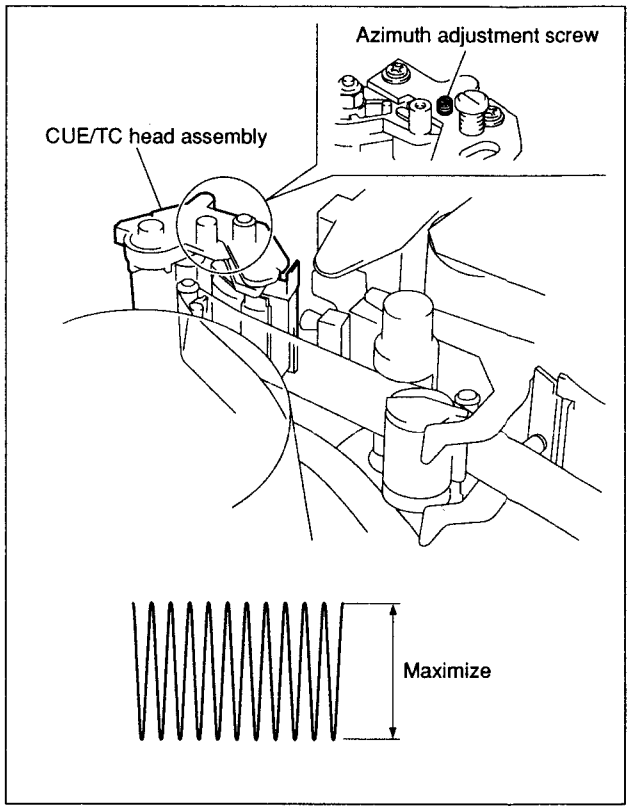
(1) Turn the azimuth adjusting screw clockwise or counterclockwise, and adjust so that the output waveform is the maximum.

(2) Repeat the mode change from EJECT mode to PLAY mode 2 or 3 times. Check that the output level is same as the pre-PLAY level and does not change.

(3) Repeat the mode change from REV SEARCH mode to PLAY mode 2 or 3 times. Check that the output level is same as the pre-PLAY level and does not change.Reference

• How to put into the REV SEARCH mode;

Press the REW button after pressing the SEARCH button.



3. SEARCH speed change

On the setup menu, reset SEARCH speed to the former speed.

7-2-15. Drum PG Phase Adjustment

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Set the DIP switches. (Refer to "7-2-4. DIP switch Setting".)
4. Remove the ornamental plate on the left side panel. (Refer to "1-13. Tracking Adjustment".)
5. Connect an oscilloscope. CH-1: TP10/MB-601 CH-2: TP8/MB-601
6. Connect a regulated DC power supply to DC IN connector on the connector panel.
7. Turn the power on.
8. Insert an alignment tape ZR2-1/1P.
9. On the setup menu, set AUTO TRACKING to OFF.
10. Turn the tracking control volume to the mechanical center(click position).

Adjustments

1. Playback the alignment tape.

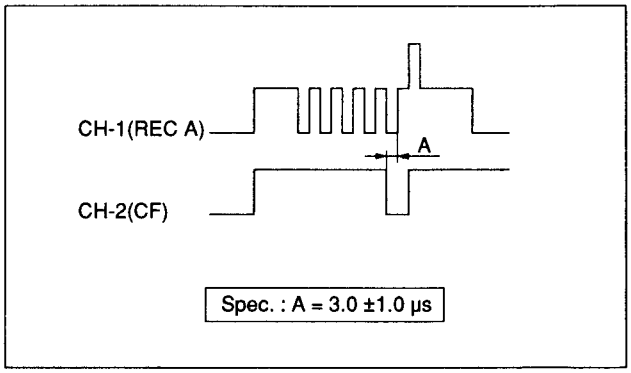
Playback the alignment tape ZR2-1/1P (00:00 to 15:00).

2. <DRUM PG> menu setting

(1) To display the DIAG menu on the display, press the DIAG button using a tip of a clip or equivalent.
(2) Move the cursor ("*") to "TEST" on the menu, and press the SET button.
(3) Move the cursor to "TTP" , and press the SET button.
(4) Move the cursor to "ADJUST" , and press the SET button.
(5) Move the cursor to "DRUM PG" , and press the SET button.

3. PG adjustment

Adjust the time A to meet the specification shown in figure by pressing the UP/DOWN button.



4. Data writing

Press the SET button to write the PG phase data.
The "ADJUSTING....." message is displayed on the audio meter LCD a few second.

7-2-16. CTL Head Position Check

Note

- The CTL head position adjustment is closely related to the CUE/TC head position adjustment. After performing the CTL head position adjustment, be sure to perform the CUE/TC head position check.

Tools

- Alignment tape ZR2-1 8-960-073-11
- Alignment tape ZR2-1P 8-960-073-61
- Torque screwdriver bit (for M2) J-6325-380-A
- Torque screwdriver (for 3 kg) J-6325-400-A
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Setting

1. Turn the power off.
2. Remove the top panel. (Refer to "1-5. Removal/Installation of Cabinet".)
3. Remove the battery case. (Refer to "1-5. Removal/Installation of Cabinet".)
4. Remove the ornamental plate on the left side panel. (Refer to "1-13. Tracking Adjustment".)
5. Set all four switches of DIP switches S1 and S2 on the UDR-9 board which attaches to the upper drum to ON.
6. Set the switch S700-1 on the EQ-54 board to ON.
7. Connect a regulated DC power supply to DC IN connector on the connector panel.
8. Turn the power on.
9. On the setup menu, set AUTO TRACKING to OFF.
10. Insert an alignment tape ZR2-1/1P.

Checks

1. Oscilloscope setting (1)

Connect an oscilloscope

CH-1 : TP10/MB-601 (REC A)

TRIG : TP8/MB-601 (CF)

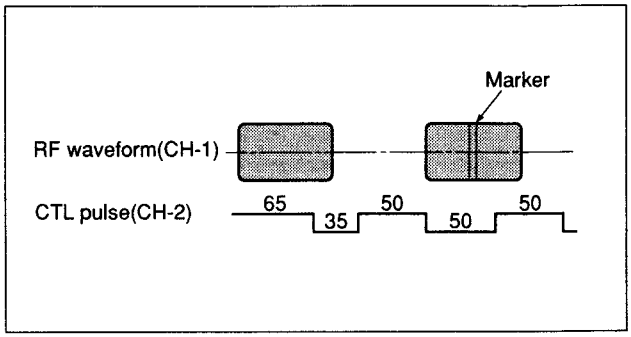
2. Playback the alignment tape

Play back the alignment tape ZR2-1/1P (from 00:00 to 15:00).

3. CTL head position check (1)

(1) Check that the output level at the center of the RF waveform is the maximum at the center click position of the tracking control volume when the tracking control volume is turned using a screwdriver.

(2) Check that the marker of the RF waveform is output the position in the figure below.



4. Oscilloscope setting (2)

Connect an oscilloscope

CH-1 : TP8/MB-601 (CF)

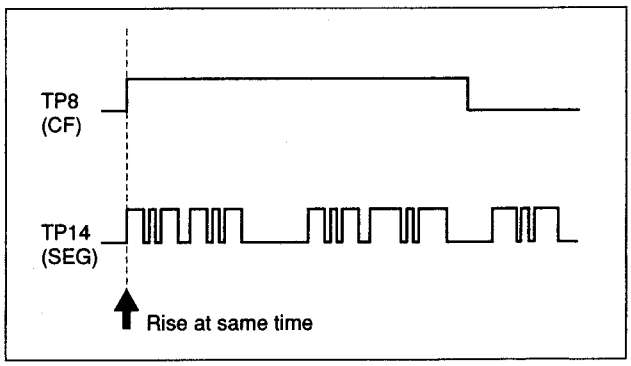
CH-2 : TP14/MB-601 (SEG)

5. Playback the alignment tape

Playback the alignment tape ZR2-1/1P (from 25:00 to 27:00).

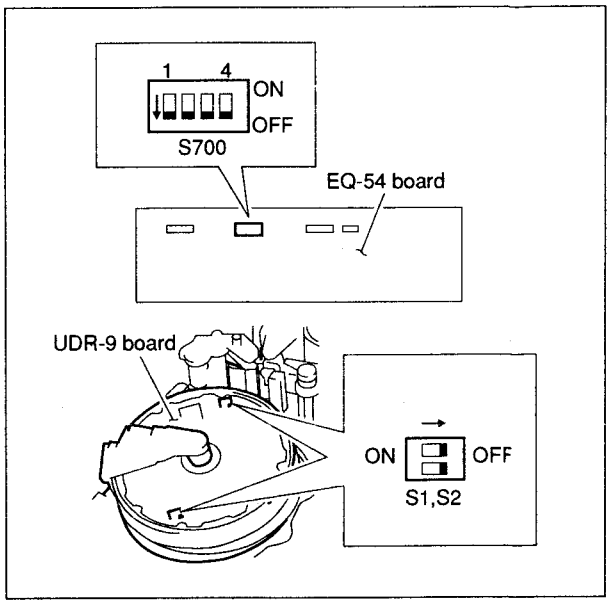
6. CTL head position check (2)

Check that each waveforms are rising at the same time.



7-2-17. DIP Switch Re-setting

1. Turn the power off.
2. Set all four switches of DIP switches S1 and S2 on the UDR-9 board which attaches to the upper drum to OFF.
3. Set the switch S700-1 on the EQ-54 board to OFF.
4. Turn the power on.



7-2-18. Self REC/PB Tracking Check

Tools

- Blank tape BCT-D124L
- Oscilloscope
- Regulated DC power supply (AC-550/550CE or equivalent)

Settings

1. Turn the power off.
2. Remove the top panel.
   (Refer to "1-5. Removal/Installation of Cabinet".)
3. Open the ornamental plate on the left side panel.
   (Refer to "1-13. Tracking Adjustment".)
4. Connect an oscilloscope
   CH-1: TP1/MB-601 (AE)
   TRIG: TP8/MB-601 (CF)
5. Connect a regulated DC power supply to DC IN connector on the connector panel.
6. Turn the power on.
7. On the setup menu, set AUTO TRACKING to OFF.

checks

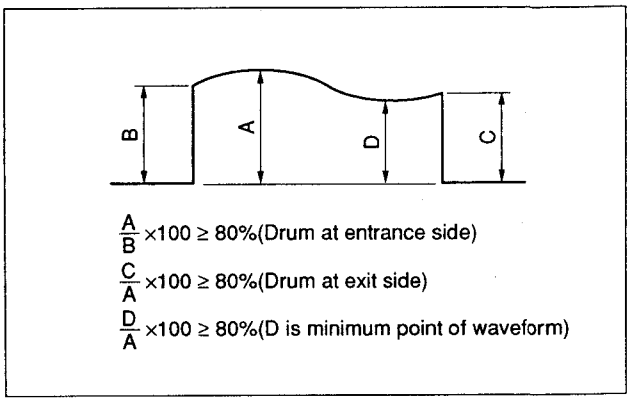
1. Recording the test signal (1)

(1) To display the DIAG menu on the display, press the DIAG button using a tip of a clip or equivalent.
(2) Move the cursor ("*") to "TEST" on the menu, and press the SET button.
(3) Move the cursor to "TTP", and press the SET button.
(4) Move the cursor to "PATH", and press the SET button.
(5) Move the cursor to "TEST SG", and press the SET button.
(6) To display the "A2" to the right side of "TEST SG", press the UP/DOWN button several times. Then, 8 MHz test signal for video A,C,E and G channels is generated.
(7) Insert a blank tape and press the REC and PLAY button simultaneously so that the test signal is recorded.
(8) Record the signal about 10 minutes and rewind the tape.
(9) Play back the recorded portion of the test signal.

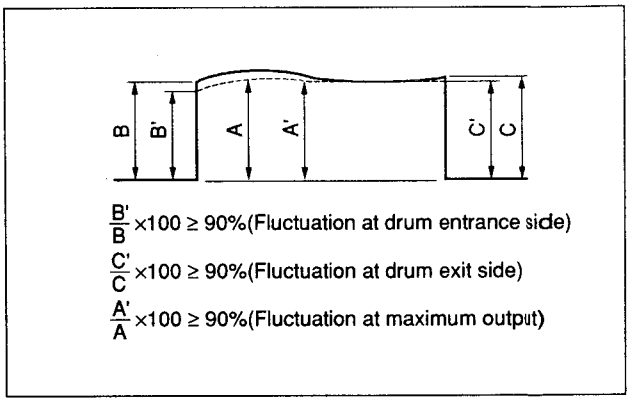
2. Tracking check

(1) Turn the tracking control volume using a screwdriver to the mechanical center (click position).

(2) Check that the waveform meets the specification 1


B
A
D
C
$\frac{A}{B} \times 100 \geq 80\%$(Drum at entrance side)
$\frac{C}{A} \times 100 \geq 80\%$(Drum at exit side)
$\frac{D}{A} \times 100 \geq 80\%$(D is minimum point of waveform)

(4) Check that the waveform meets the specification 2.



3. Start-up time check

(1) Put the unit into REC mode at the middle portion (without beginning and last 10 minutes) of BCT-D124L cassette.

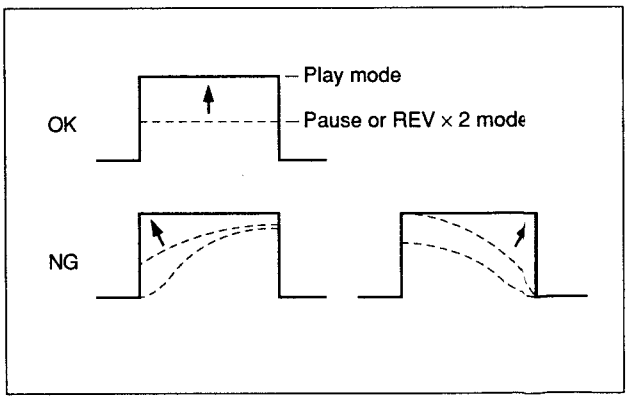
(2) Repeat the REC-PAUSE on/off operation two or three times at about 10 munites intervals, and rewind the tape.

(3) Play back the recorded portion of the test signal.

(4) Check that the start-up time of the waveform at REC-PAUSE on/off point is within 1 sec., and the tape curl at the lead disappeares within 0.5 sec. (Spec. 3)

(5) Put the unit into REC mode at the end portion of BCT-D124L cassette.

(6) Perform steps (2) to (4), and check the start-up time of the waveform.



4. Connect the CH-1 of the oscilloscope to TP3 (CG) on the MB-601 board and perform the steps 2 and 3.

5. Recording the test signal (2)

(1) Perform the steps (1) to (5) in step 1.
(2) To display the "B2" to the right side of "TEST SG", press the UP/DOWN button several times. Then 8 MHz test signal for video B,D,F and H channels is generated.
(3) Perform the steps (7) to (9) in step 1.

6. Tracking check

(1) Connect the CH-1 of the oscilloscope to TP2 (BF) on the MB-601 board and perform the steps 2 and 3.
(2) Connect the CH-1 of the oscilloscope to TP4 (DH) on the MB-601 board and perform the steps 2) and 3).

7. Perform step 3, and check the start-up time meet the specification 3.

If the specifications 1 and 2 are not met for two kind of head-to-tape contact checks, perform the adjustment from "7-2-5. S1 Guide Slantness Adjustment" and later.
If the specification at the exit side is not met, perform the adjustment from "7-2-8. T1 Guide Slantness Adjustment" and later.

7-2-19. Tape Running Check

Tools

• Inspection mirror (Small oval type)	J-6080-840-A
• Alignment tape ZR2-1	8-960-073-11
• Alignment tape ZR2-1P	8-960-073-61
• Digital Betacam cassette BCT-D124L	Standard product

Checks (S side)

1. Play mode (Beginning portion of the tape)

(1) Put into the PLAY mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape running conditions (tape curl and tape contacting flange of tape guide) at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum meet the following specification 1.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

2. REV SEARCH mode (Beginning portion of the tape)

(1) On the setup menu, set SEARCH speed to ×2. (Refer to Section 3-1.)

(2) Put into the REV SEARCH mode (press the REW button after pressing the SEARCH button) at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(3) Check that the tape runs without any curl at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

3. F FWD mode (Beginning portion of the tape)

(1) Put into the F FWD mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape runs without any curl at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

4. REW mode (Beginning portion of the tape)

(1) Put into the REW mode at the beginning portion of an alignment tape ZR2-1/1P (from 5:00 to 10:00)

(2) Check that the tape runs without any curl at S5 guide, S4 guide, S3 guide, S2 guide and lead of the drum.
If tape curl occurs by all means, the tape curl shown in the table below is acceptable.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

5. Play mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the PLAY mode at the end portion of BCT-D124L.

(2) Check the tape running conditions as the same manner of step (2) in 1.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

6. REV SEARCH mode
(Latter half portion of the tape without last 10 minutes.)

(1) Put into the REV SEARCH mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (3) in 2.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

7. F FWD mode
(Latter half portion of the tape without last 10 minutes.)

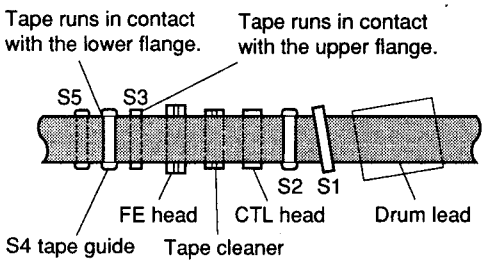
(1) Put into the F FWD mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (2) in 3.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

8. REW mode (Latter half portion of the tape without last 10 minutes.)

(1) Put into the REW mode at the end portion of BCT-D124L.
(2) Check the tape curl as the same manner of step (2) in 4.
If not, perform the adjustment from "7-2-1. S3/S5 Tape Guide Height Adjustment".)

Specification 1

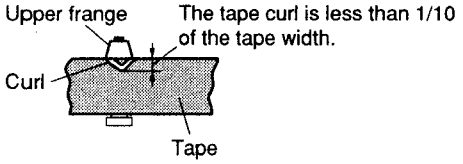
		Guide				Lead of drum
		S5	S4	S3	S2	
PLAY mode	Acceptable range of tape curl	Less than 1/10 of tape width	Less than 1/10 of tape width (*1)	Not acceptable	Less than 1/10 of tape width (*1)	Not acceptable
	Tape contacting flange	Upper (or Lower)	Lower	Upper	Upper	——



Acceptable range of tape curl

	Guide				Lead of drum
	S5	S4	S3	S2	
Rev ×2 mode F FWD mode REW mode	Less than 1/10 of tape width	Less than 1/10 of tape width	Not acceptable	Less than 1/10 of tape width (*1)	Less than 1/10 of tape width (*2)

*1: Tape curl at the center of tape wrap is not acceptable.
*2: Tape curl should be disappeared within 1 sec. when the mode change is performed from each mode to PLAY.



Checks (T side)

9. Check T3 guide, T2 guide and lead of the drum

Check that the tape running conditions (tape curl and tape contacting flange of tape guide) at T3 guide, T2 guide and lead of the drum meet the following specification 2 and table in the same way of steps 1) to 8).
If not, perform the adjustment from "7-2-11. T3 Guide Height Adjustment".)

Specification 2

	Guide		Lead of drum
	T3	T2	
Acceptable range of tape curl	Less than 1/10 of tape width	Less than 1/10 of tape width	Not acceptable
Tape contacting flange	Upper	Lower	——

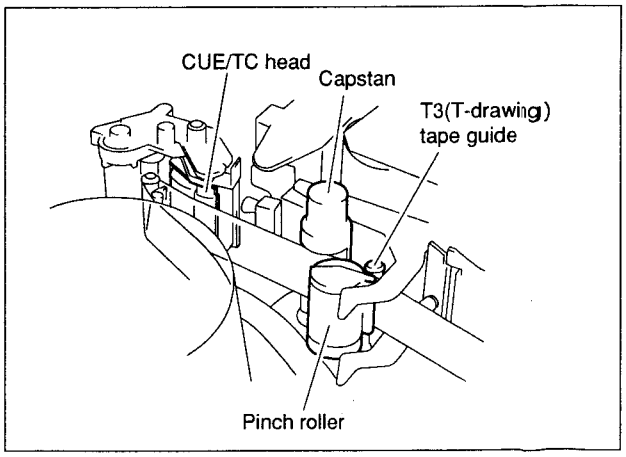
Acceptable range of tape curl

	Guide		Lead of drum
	T3	T2	
Rev x2 mode F FWD mode REW mode	Not acceptable	Less than 1/10 of tape width (*1)	Less than 1/10 of tape width (*2)

*1: Tape curl at the center of tape wrap is not acceptable.
*2: Tape curl should be disappeared within 1 sec. when the mode change is performed from each mode to PLAY.

10. Tape running check around the capstan shaft

(1) Put into the REW mode any portion of BCT-D124L. After 2 or 3 seconds, put into the play back mode. When changing the mode, check that the tape running condition meets specification 3 between CUE head and capstan shaft.



Specification 3

Tape runs without any wrinkle.
If the tape wrinkle occurs, check that the tape wrinkle disappears within 2 seconds and do not damage the tape.

(2) Repeat the step (1) 2 or 3 times and re-check.
(3) Put into the F FWD mode, and after 2 or 3 seconds put into the PLAY mode.
Check that the specification is met.
If not, Perform the steps 10) and later.
(4) Put into the REV SEARCH mode, and after 2 or 3 seconds put into the PLAY mode.
Check that the specification is met.
If not, perform the adjustment from "7-2-11. T3 Guide Height Adjustment".)

7-2-20. Locking Compound Applying

After the tape path adjustments are completed, apply a locking compound on the following portion.

Notes

Never apply the locking compound on the tape running surface or hexagonal hole of the set screw.

1. Guide

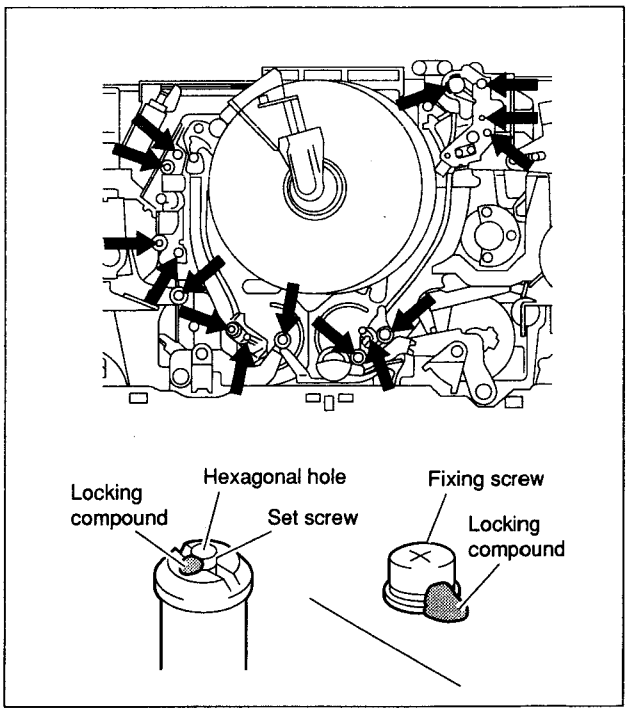
- S1 guide slantness adjustment screws (2 pcs)
- Fixing screw of S2 guide
- Fixing screw of S4 guide
- Fixing screw of S5 guide
- T1 guide slantness adjustment screws (2 pcs)
- Fixing screw of T2 guide
- Fixing screw of T3 guide

2. Entrance head assembly

- Height adjustment nut
- Fixing screws (2 pcs)
- Fixing screw of S3 guide

3. CUE head assembly

- Height adjustment nut
- TC head position adjustment screws (2 pcs)
- CUE head mounting screws (2 pcs)
- Azimuth/Zenith adjustment screw



Section 8
Replacement of Circuit Boards

8-1. General Information for Boards Replacement

Index for board replacement

Board	Section	Adjustment
ADA-44	8-5	Required
DIF-31	8-2-2	Required
DPR-62	8-2-4	×
EQ-54	8-6	Required
KY-315	8-4	×
SST-3	8-3	Required
VPR-12	8-2-3	Required

Refer to Maintenance Manual Part2 Volume1 Section4, when replacing the boards not listed in this table.

8-2. Video Boards Assembly Replacement

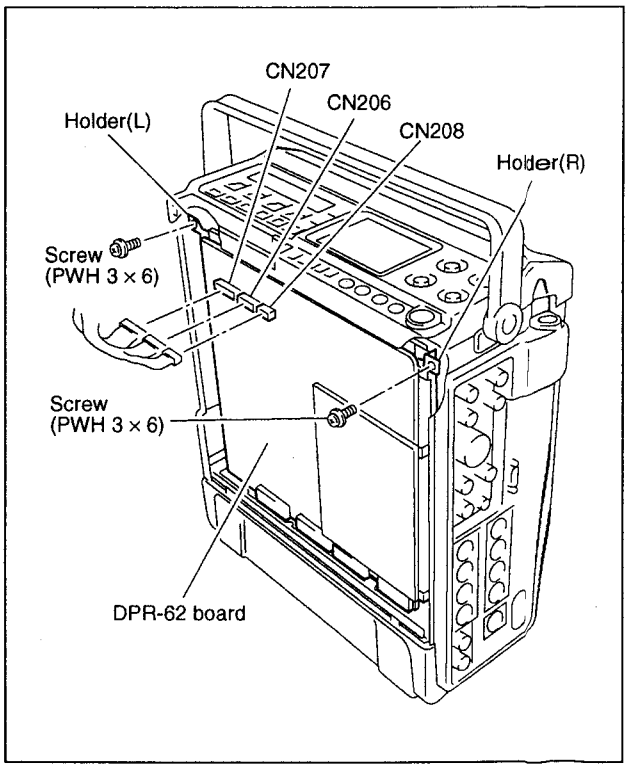
Note

Video boards assembly: DIF-31 Board, DPR-62 Board and VPR-12 Board

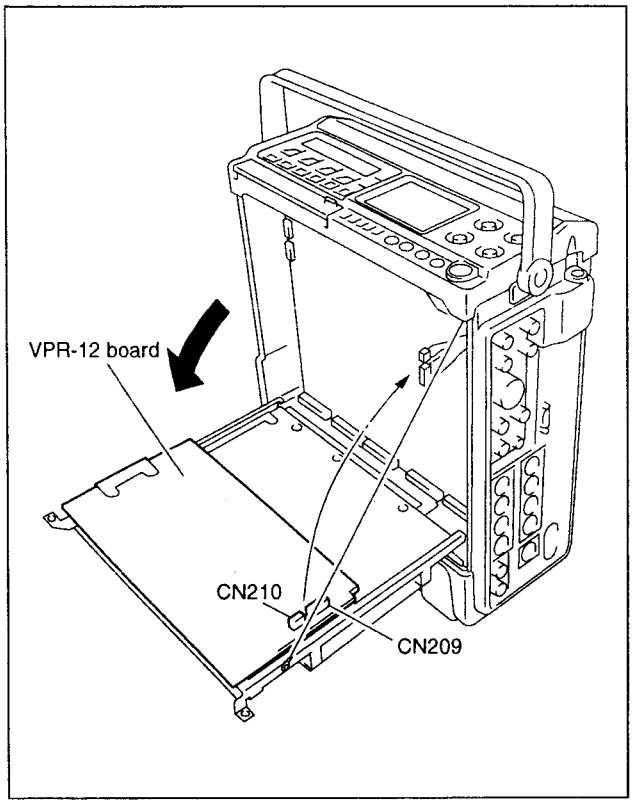
8-2-1. Opening/Removal of Video Boards Assembly

Opening the video boards assembly

1. Remove the bottom plate. (Refer to "1-5. Removal/ Installation of Cabinet".)
2. Remove the screws fixing the holder (L) and holder (R).
3. Disconnect the connectors CN206 through CN208 on the DPR-62 board.

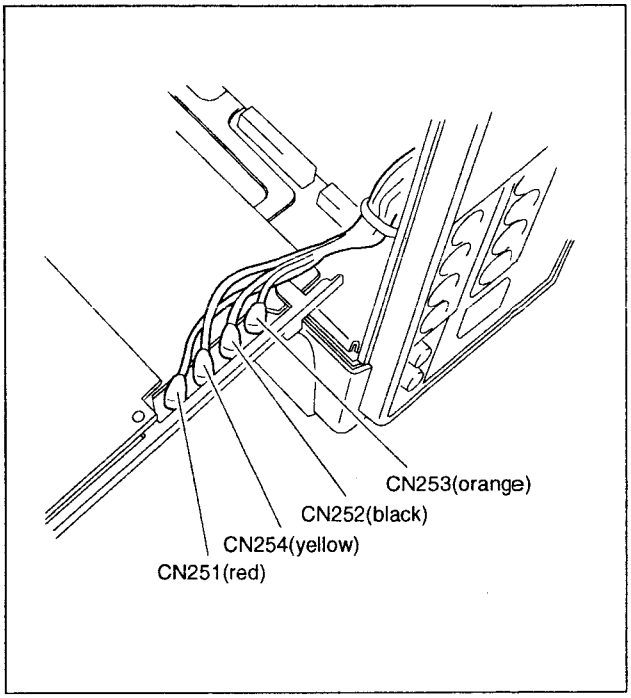


4. Open the video boards assembly in the direction indicated by the arrow.
5. Disconnect the connectors CN209 and CN210 on the VPR-12 board.

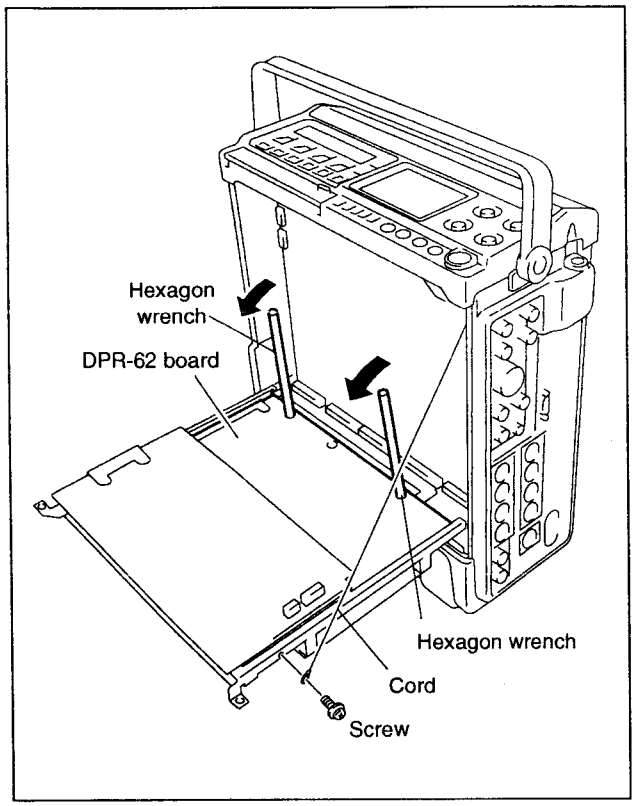


Video boards assembly removal

1. Open the video boards assembly.
2. Disconnect the coaxial cables CN251 through CN254 on the DIF-31 board.

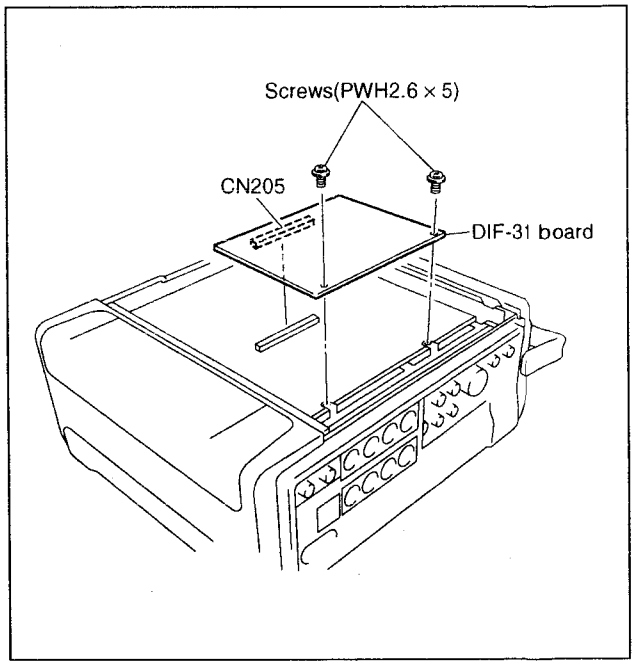


3. Remove a screw fixing the cord.
4. Insert the hexagon wrenches (across 1.5 mm) into the two holes of the DPR-62 board, and move them in the direction indicated by the arrow to disconnect the board-to-board connectors CN908 through CN911.



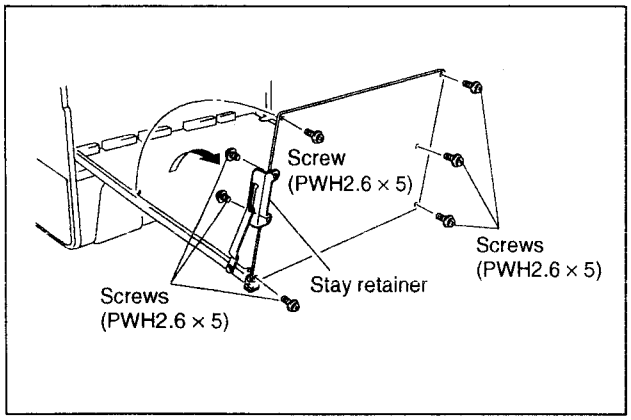
8-2-2. DIF-31 Board Removal

1. Open the video boards assembly. (Refer to Section 8-2-1.)
2. Disconnect the coaxial cables CN251 through CN254.
3. Remove the two screws and disconnect the board-to-board connector CN205.

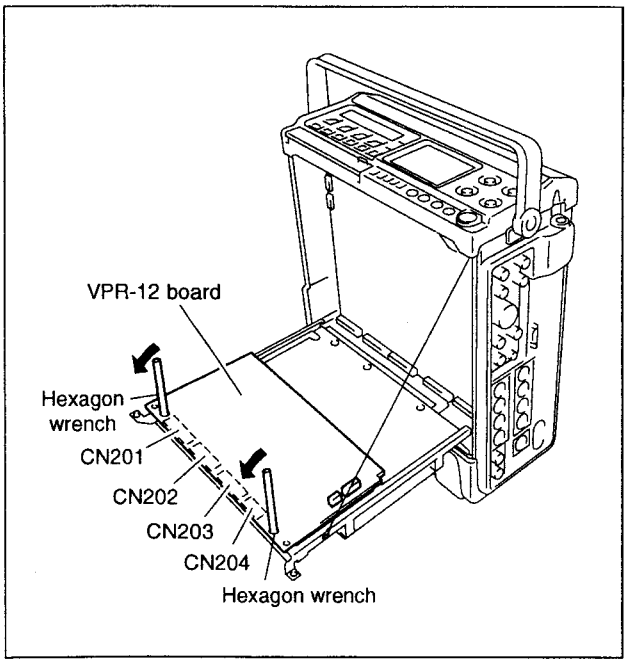


8-2-3. VPR-12 Board Removal

1. Open the video boards assembly. (Refer to Section 8-2-1.)
2. Remove the five screws fixing the VPR-12 board.
3. Remove the two screws fixing the stay retainer.

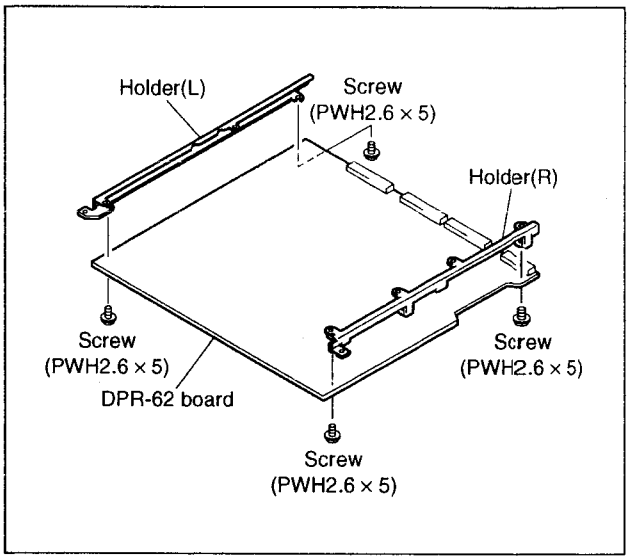


4. Insert the hexagon wrenches (across 1.5 mm) into the holes of the VPR-12 board, and move them in the direction indicated by the arrow to disconnect the board-to-board connectors CN201 through CN204.



8-2-4. DPR-62 Board Removal

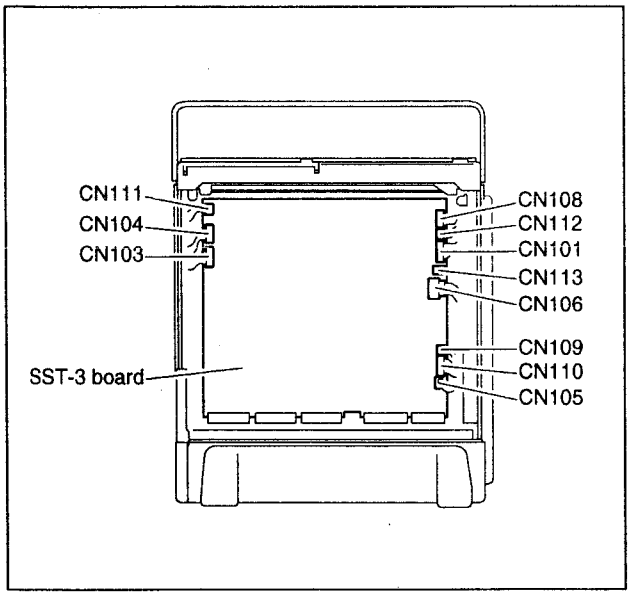
1. Open the video boards assembly. (Refer to Section 8-2-1.)
2. Remove the DIF-31 board and VPR-12 board. (Refer to Sections 8-2-2 and 8-2-3.)
3. Remove the four screws fixing the holder (L) and holder (R).



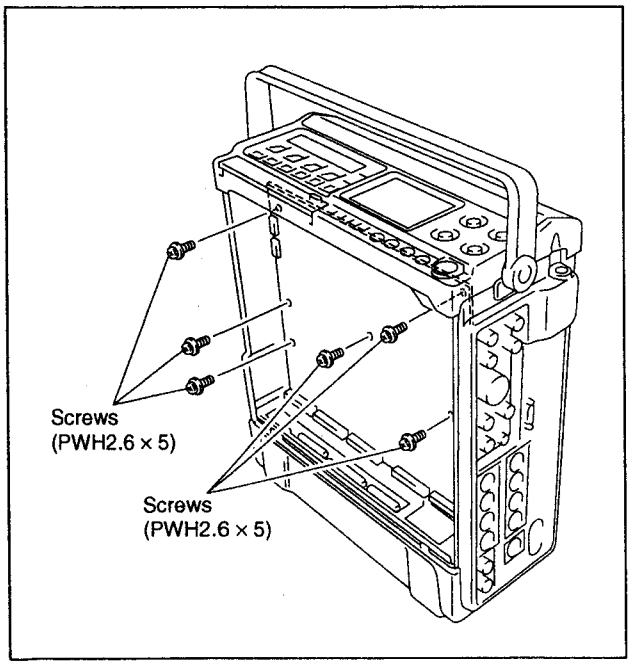
4. Attach the holder (L) and holder (R) to a new DPR-62 board.

8-3. SST-3 Board Removal

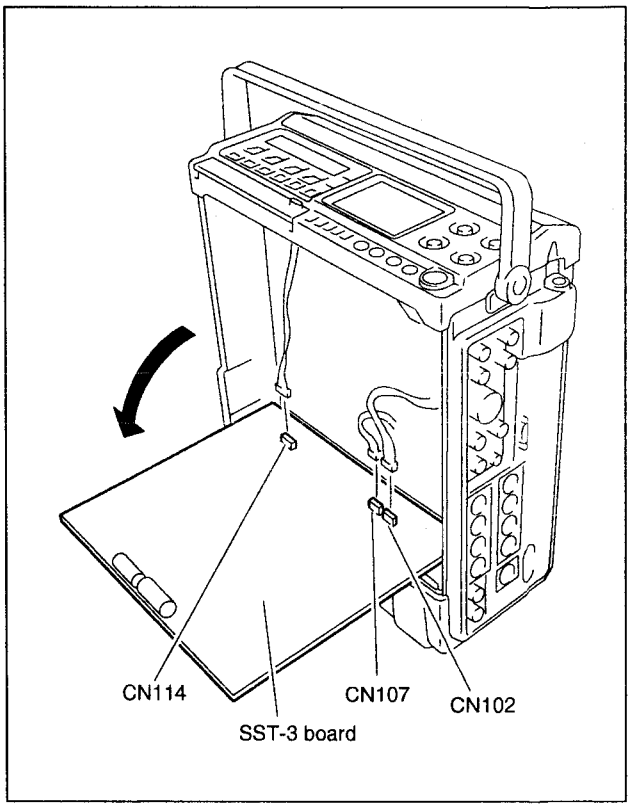
1. Remove the video boards assembly. (Refer to Section 8-2-1.)
2. Disconnect the connectors CN101, CN103 through CN106, and CN108 through CN113 on the SST-3 board.



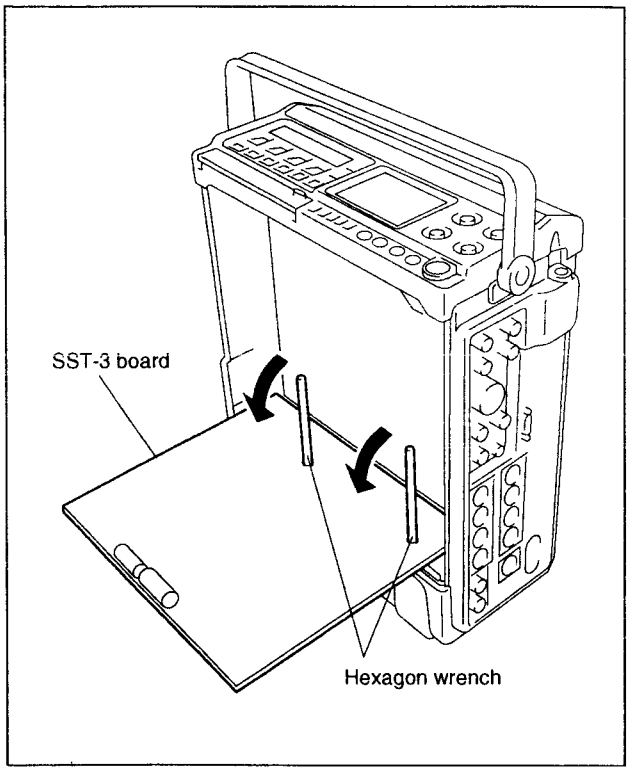
3. Remove the six screws fixing the SST-3 board.



4. Open the SST-3 board and disconnect the connectors CN102, CN107 and CN114.

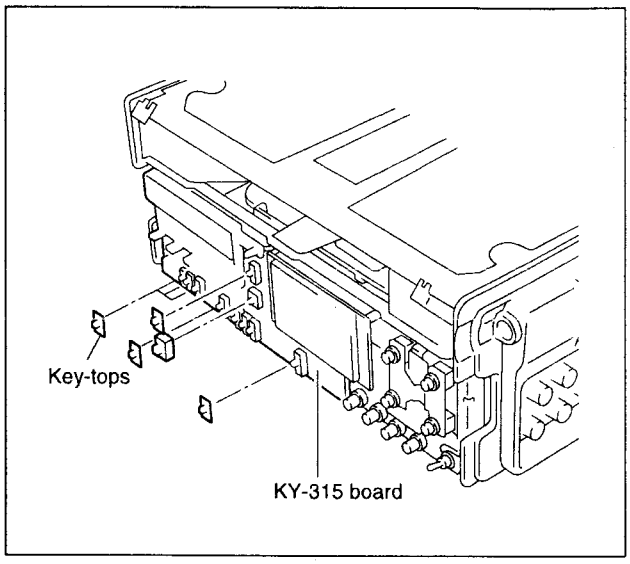


5. Insert the hexagon wrenches (across 1.5 mm) into the holes of the SST-3 board, and move them in the direction indicated by the arrow to disconnect the board-to-board connectors CN901 through CN905.

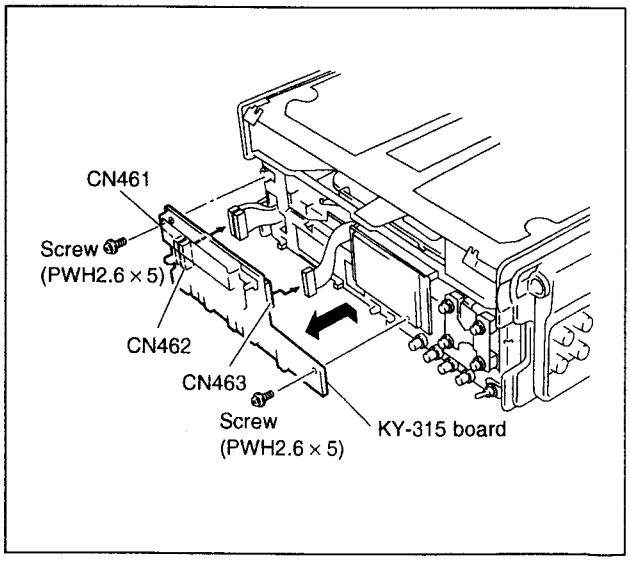


8-4. KY-315 Board Removal

1. Remove the top panel, front cover and front panel. (Refer to "1-5. Removal/Installation of Cabinet".)
2. Remove the key-tops on the KY-315 board.

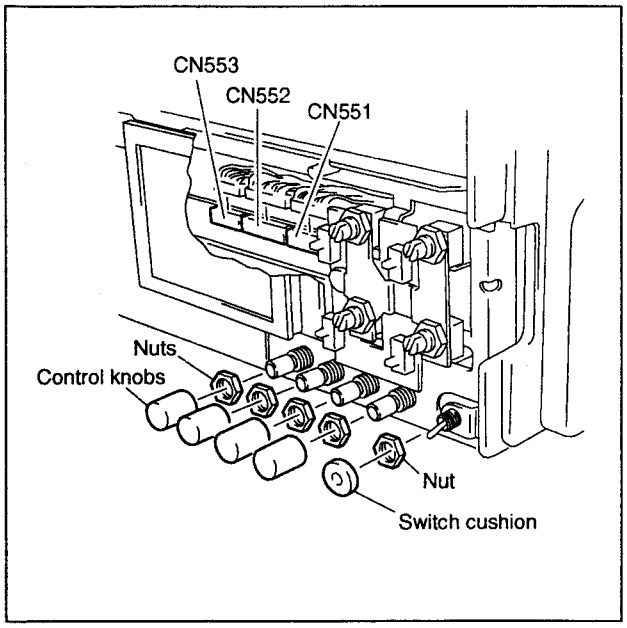


3. Remove the two screws fixing the KY-315 board.
4. Slide the KY-315 board in the direction indicated by the arrow.
5. Disconnect the connectors CN461 through CN463 while removing the KY-315 board.

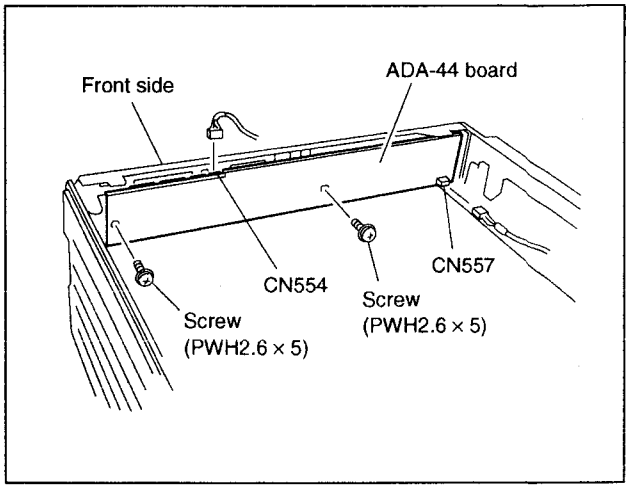


8-5. ADA-44 Board Removal

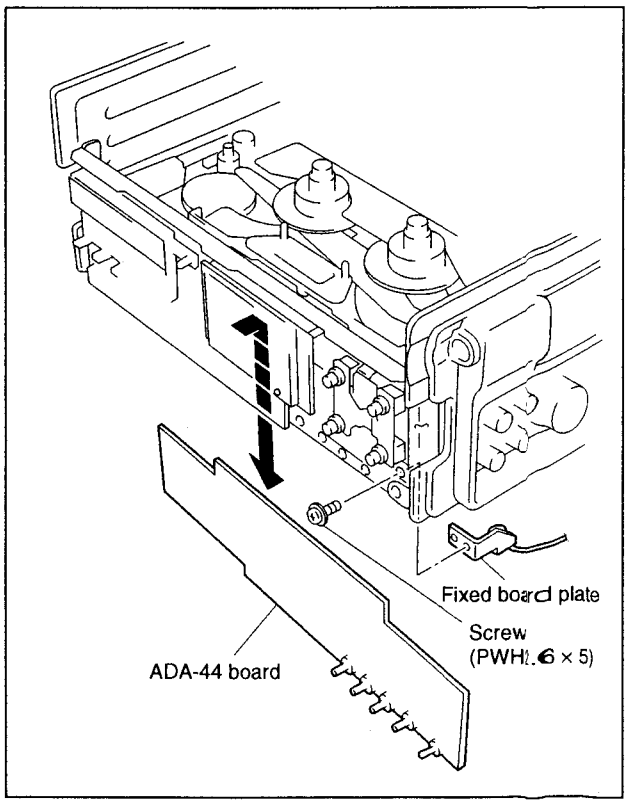
1. Remove the top panel, front cover, front panel and bottom plate. (Refer to "1-5. Removal/Installation of Cabinet ".)
2. Remove the cassette compartment. (Refer to Section 1-6.)
3. Remove the four control knobs and remove the switch cushion.
4. Remove the five nuts.
5. Disconnect the connectors CN551 through CN553.



6. Open the video boards assembly. (Refer to Section 8-2-1.)
7. Remove the two screws and disconnect the connectors CN554 and CN557 on the ADA-44 board.



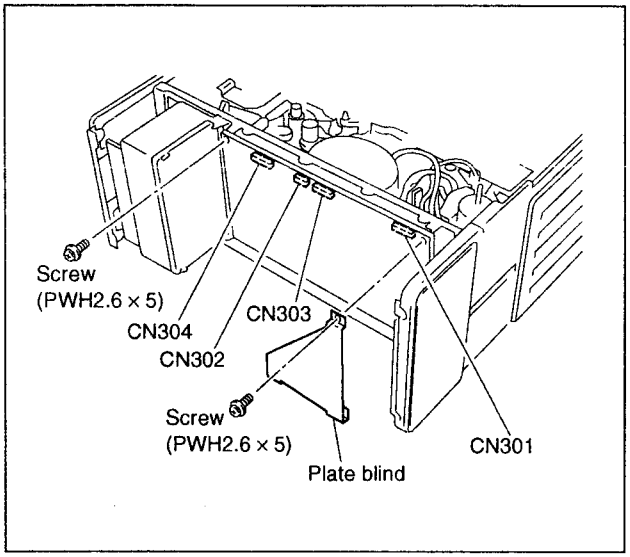
8. Remove one screw and remove the fixed board plate.
9. Remove the ADA-44 board from the unit by sliding it in the direction indicate by the arrow.



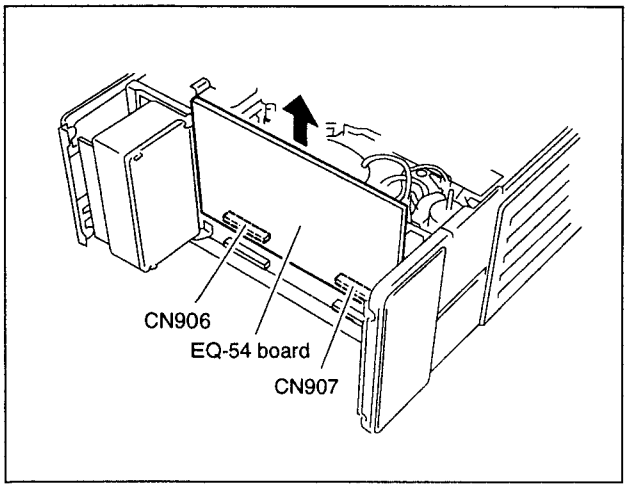
8-6. EQ-54 Board Replacement

Removal

1. Remove the battery case. (Refer to "1-5. Removal/ Installation of Cabinet ".)
2. Remove the two screws fixing the EQ-54 board and plate blind, and then disconnect the connectors CN301 through CN304.



3. Slide the EQ-54 board in the direction indicated by the arrow and disconnect the board-to-board connectors CN906 and CN907.

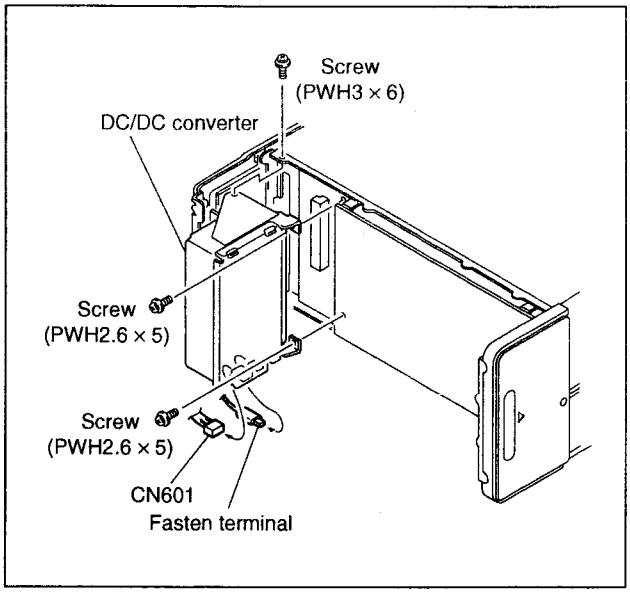


Note During Installation

- When connecting the harness to CN304 on the EQ-48 board, twist the connection harness five turns or more, and connect it to CN304.

8-7. DC/DC Converter Removal

1. Remove the top panel, bottom plate and battery case. (Refer to "1-5. Removal/Installation of Cabinet".)
2. Remove the three screws fixing the DC/DC converter.
3. Disconnect the connector CN601 and fasten terminal CN602, and then remove the DC/DC converter from the unit.
   (CN602 disconnection : Pinch the terminal and pulled out.)



Section 9
Electrical Alignment

9-1. General Information for Electrical Adjustment

9-1-1. Notes for Adjustment

Before adjustment, turn the power on and warm up the unit for about 10 munites.
Be sure to put the unit into EE mode according to the following procedures, if neccessary.
MODE switch/connector panel → PB/EE
Put the unit into STOP mode.

9-1-2. Equipment/Fixtures

Equipment	Model
AC Adapter or Battery	Sony AC-550 (for UC) /550CE (for SY) or equivalent
Oscilloscope	Tektronix 2465B or equivalent
Analog Composite Signal Generator	Tektronix 1410 (for NTSC) /1411 (for PAL) or equivalent
Waveform Monitor/Vectorscope	Tektronix 1750 (for NTSC) /1751 (for PAL) or equivalent
Digital Voltmeter	Advantest TR6845 or equivalent
Audio Level Meter	Hewlett Packard HP 3400A or equivalent
Audio Analyzer	Tektronix AA501A (OP.02) or equivalent
Audio Oscillator	Tektronix SG-5010 or equivalent
Audio Noise Meter	READER LMV-189AR or equivalent
Audio Distortion Meter	Tectronix AA5010 or equivalent
Monitor	Sony BVM-1410 or equivalent
Frequency Counter	Advantest TR5821AK or equivalent
Alignment Tape ZR5-1 (for NTSC)	Part No. : 8-960-073-01
Alignment Tape ZR5-1P (for PAL)	Part No. : 8-960-073-51
Alignment Tape ZR2-1 (for NTSC)	Part No. : 8-960-073-11
Alignment Tape ZR2-1P (for PAL)	Part No. : 8-960-073-61
Blank Tape *1	Digital Betacam Cassette Tape
Extension Harness	Part No. : J-6421-430-A (for VIDEO)*2
	Part No. : J-6421-440-A (for AUDIO)*3
Extension Board	Part No. : J-6421-330-A (for DIF-31)

Note:
*1: "Blank Tape" indicates a cassette tape on which no video/audio signals are recorded.
*2: Connect between the following connectors when open the video boards assembly.
CN209 (K-2) /VPR-12 — (12 pins) — CN457 (A-2) /CC-66
CN210 (K-3) /VPR-12 — (8 pins) — CN456 (B-2) /CC-66
*3: Connect between the following connectors when open the video boards assembly.
CN206 (H-2) /DPR-62 — (10 pins) — CN555 (D-3) /ADA-44
CN207 (H-2) /DPR-62 — (12 pins) — CN556 (B-3) /ADA-44
CN208 (H-2) /DPR-62 — (6 pins) — CN559 (D-3) /ADA-44

9-1-3. Initial settings for switches

[Connector Panel]

CAMERA/VIDEO/SDI input select switch → VIDEO
MODE switch → PB/EE
CH-3/4 OUT switch → LINE
CUE REC switch → ON
CONFI switch → ON
COLOR FRAME switch → OFF
EXT DC SELECT switch → AUTO
CAMERA/LINE audio input select switch (CH-1 to CH-4) → LINE

[Front Panel]

UNI/VAR switch (CH-1 to CH-4) → UNI

9-1-4. Test Signals

Alignment Tape ZR5-1 (Part No. 8-960-073-01)
ZR5-1P (Part No. 8-960-073-51)

TIME min.:sec.	CTL	VIDEO	D-AIDIO	CUE	TIME min.:sec.
00 : 00				*1	00 : 00
		Color Bars (100%)	1 kHz-20 dB FS	1 kHz 0 VU	01 : 25
				Blank	01 : 30
02 : 00				*2	
				1 kHz -20 VU	02 : 25
				Blank	02 : 30
				3 kHz -20 VU	02 : 55
			1 kHz 0 dB FS	Blank	03 : 00
				*2	
				7 kHz -20 VU	03 : 25
				Blank	03 : 30
				10 kHz -20 VU	03 : 55
04 : 00				Blank	04 : 00
				*2	
				12 kHz -20 VU	04 : 25
			-∞dB FS	Blank	04 : 30
				90 kHz -20 VU	04 : 55
				Blank	05 : 00
06 : 00					
			20 Hz-20 dB FS	Repeat	
08 : 00					
			20 kHz-20 dB FS		
10 : 00					10 : 00
		Repeat	Repeat	Repeat	
20 : 00					20 : 00

Alignment Tape ZR2-1 (Part No. 8-960-073-11)
ZR2-1P (Part No. 8-960-073-61)

TIME min.:sec.	CTL TRACK	CUE TRACK	VIDEO/AUDIO TRACK
00 : 00	CTL	1 kHz, 0 VU	4MHz (A CH only)
(7 : 3 PULSE)			
15 : 00	CTL	12 kHz, 0 VU	A,C CH-4MHz B,D CH-8MHz
20 : 00	CTL	12 kHz, 0 VU	16MHz (ALL CH)
25 : 00	CTL	———	50% FLAT FIELD (ALL CH)
27 : 00			

Note :
*1: When this tape is reproduced in the audio reference level check or adjustment, the output level (0 dB) should be corrected according to the correction value as follows.
Example: Correction value = -0.5 dB
Output level = 0 dB -0.5 dB = -0.5 dB
*2: When this tape is reproduced in the audio frequency responce check or adjustment, the output level should be corrected according to the correction value.

9-1-5. Adjustment after Replacement of Boards and/or Blocks

After the board and/or block is replaced, excutes the following adjustment.

Block/Board name	Adjustment
Drum	9-3. Servo Adjustment
	9-5-1. RF Parameter Initialize
	9-5-4. Phase Adjustment to 9-5-13. Save the Adjustment Data
CUE head	9-4-4. CUE ERASE Current Adjustment to 9-4-7. CUE REC Level Adjustment
Lithium battery/SST-3	No adjustment is required.
SST-3	9-2-1. SST-3 Board Voltage Adjustment
	9-3. Servo System Adjustment
	9-4-4. CUE ERASE Current Adjustment
	9-5-7. Equalizer (AMP) Adjustment to 9-5-13. Save the Adjustment Data
DC/DC converter	No adjustment is required.
ADA-44	9-4-1. PB Level/Distortion Adjustment to 9-4-3. DC Offset Adjustment
EQ-54	9-4-5. CUE Channel PB Frequency Characteristics Adjustment to 9-4-7. CUE REC Level Adjustment
	9-5. RF System adjustment
DIF-31	9-6. VIDEO System Adjustment-1
VPR-12	9-7-1. Pedestal Level Adjustment to 9-7-4. INPUT SYNC Level Adjustment
DPR-62	No adjustment is required.

9-2. Power/Control System Adjustment

9-2-1. SST-3 Board Voltage Adjustment

Preparation

Adjustment procedure

1. +5 V Adjustment
   Equipment : Digital volt meter
   Test point : TP5 (B-8) /SST-3
   GND : E6 (H-5) /SST-3
   Adjustment point : ⊘RV1 (C-7) /SST-3
   Specification : +5.00 $^{+0.01}_{-0.00}$ V dc

2. -8.5 V Adjustment
   Equipment : Digital volt meter
   Test point : TP6 (B-8) /SST-3
   GND : E6 (H-5) /SST-3
   Adjustment point : ⊘RV2 (B-7) /SST-3
   Specification : -8.5 ±0.1 V dc

9-3. Servo System Adjustment

Preparation

Eject a tape.

9-3-1. EEPROM Data Initialize

1. On the DIAG menu, set PAGE as follows.
   PAGE : <TTP><ADJUST><INIT>

2. Press the SET button.

   The "INITIALIZING....." message is displayed on the audio meter LCD.

3. When this initialize is completed, the "INITIALIZED" message is displayed on the audio meter LCD.

9-3-2. Click Position Correction of Tracking Volume

1. ⊘RV401 (A-4) /SST-3 → Mechanical center (Click position)
   (Tracking control volume)

2. On the DIAG menu, set PAGE as follows.
   PAGE : <TTP><ADJUST><TRACON VR>

3. Press the SET button.
   (Executed the automatic adjustment.)
   The "ADJUSTING....." message is displayed on the audio meter LCD.

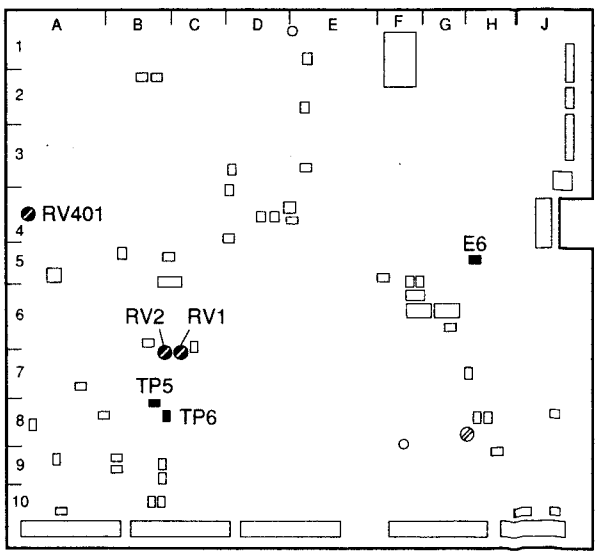
4. When this adjustment is completed, the "ADJUST COMPLETE" message is displayed on the audio meter LCD.

9-3-3. Capstan FG Duty Adjustment

1. On the DIAG menu, set PAGE as follows.
   PAGE : <TTP><ADJUST><CAP FG DUTY>

2. Press the SET button.
   (Executed the automatic adjustment.)
   The "ADJUSTING....." message is displayed on the audio meter LCD.

3. When this adjustment is completed, the "ADJUST COMPLETE" message is displayed on the audio meter LCD.
   If the "ADJUST INCOMPLETE" message is displayed, Check the circuit (SST-3 board) relevant to capstan motor.



SST-3 Board A side

9-3-4. Capstan Free Speed Adjustment

1. On the DIAG menu, set PAGE as follows.
   PAGE : <TTP><ADJUST><CAP SPEED>

2. When alignment tape ZR2-1/P is inserted into this unit,this adjustment is initiated automatically
   The "ADJUSTING....." message is displayed on the audio meter LCD.
   Note
   Be sure to use alignment tape ZR2-1/P. If not, the adjustment is not performed correctly even if the "ADJUST COMPLETE" message is displayed after adjustment is completed.

3. When this adjustment is completed, the "ADJUST COMPLETE" message is displayed on the audio meter LCD. And the tape is ejucted automatically.
   If the "ADJUST INCOMPLETE" message is displayed, Check the circuit (SST-3 board) relevant to capstan motor and CTL head.

9-3-5. Drum PG Phase Adjustment

1. Turn the power off.

2. Select the all four switches of switches S1 and S2 on the UDR-9 board which attaches to the upper drum to the TEST (ON).

3. S700-1 (C-1) /EQ-54 → ON

4. Turn the power on.

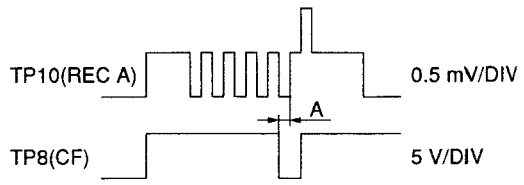
5. ◐RV401 (A-4) /SST-3 → Mechanical center (Click position)
   (Tracking control volume)

6. Connect a oscilloscope.
   CH1 : TP10 (D-3) /MB-601
   CH2 : TP8 (E-3) /MB-601

7. Insert an allignment tape (ZR2-1/P) and play back the 4 MHz (A channel only) recorded portion (TIME; 00 : 00 : 00 - 14 : 59 : 29).
   Note
   Never play back the alignment tape 15 minutes and later.

8. On the DIAG menu, set PAGE as follows.
   PAGE : <TTP><ADJUST><DRUM PG>

9. Adjust the time A to meet the following specification by pressing the UP/DOWN button.
   Specification : A = 3.0 ±1.0 µs



10. Press the SET button to write the PG phase data.
    The "ADJUSTING....." message is displayed on the audio meter LCD.

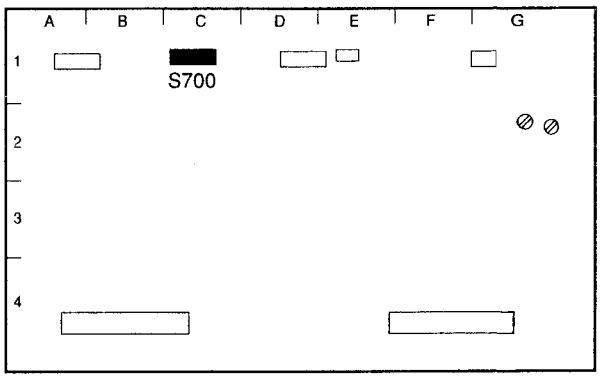
11. Eject the tape.

9-3-6. Save the Servo Data

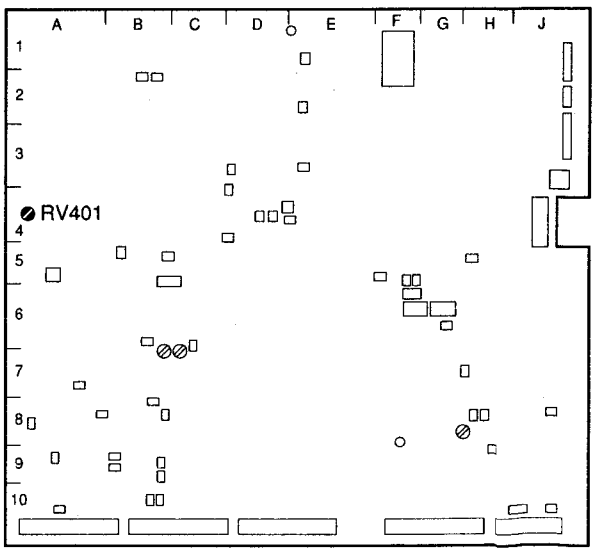
1. On the DIAG menu, set PAGE as follows.
   PAGE : <TTP><ADJUST><SAVE>

2. Press the SET button.
   The "SAVING....." message is displayed on the audio meter LCD.

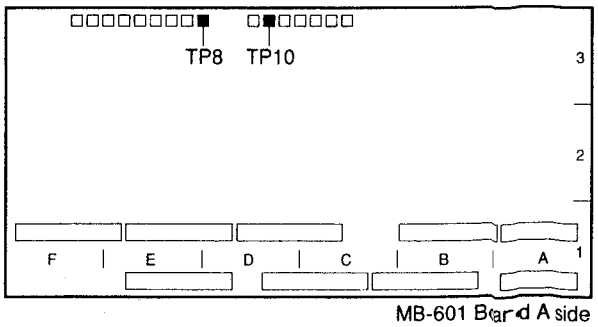
3. When this saving is completed, the "DATA SAVED" message is displayed on the audio meter LCD.



EQ-54 Board A side



SST-3 Board A side



MB-601 Board A side

9-4. Audio System Adjustment

9-4-1. PB Level/Distortion Adjustment

Preparation

- SL1-SL8/ADA-44 → OPEN (Head room : 20 dB)
- CH-3/4 OUT switch/connector panel → LINE
- Put the unit into the EE mode.
  MODE switch/connector panel → PB/EE
  Put the unit into STOP mode.
- On the setup menu, set PAGE and ITEM as follows.
  PAGE : <AUDIO>
  ITEM : INPUT 1/2 → ANA
  ITEM : INPUT 3/4 → ANA
  ITEM : EMPHASIS → OFF
- On the DIAG menu, set PAGE and ITEM as follows.
  PAGE : <TEST><PROC1>
  ITEM : AUDIO TEST → 1 (1 kHz, 0 dB)

Adjustment procedure

1. CH-1 PB Level Adjustment
   Equipment : Audio level meter
   Test point : AUDIO OUT CH-1 connector
   Adjustment point : ⊘RV205 (C-2 : B) /ADA-44
   Specification : +4.0 ±0.1 dBm (600 Ω)

2. CH-1 Distortion Adjustment
   Equipment : Audio distortion meter
   Test point : AUDIO OUT CH-1 connector
   Adjustment point : ⊘RV201 (A-3 : B) /ADA-44
   Specification : Minimum (0.03% or less)

3. Adjust the distortion for channnel-2 through 4 in the same way.

	Test point	Adjustment point	
		PB level	Distortion
CH-2	AUDIO OUT CH-2	⊘RV206 (D-2 : B)	⊘RV202 (A-3 : B)
CH-3	AUDIO OUT CH-3	⊘RV207 (E-2 : B)	⊘RV203 (A-2 : B)
CH-4	AUDIO OUT CH-4	⊘RV208 (E-2 : B)	⊘RV204 (A-2 : B)

4. Setting after adjustment
   Reset switches and menu to the former positions.

9-4-2. INPUT Level Adjustment

Preparation

- SL1-SL8/ADA-44 → OPEN (Head room : 20dB)
- Put the unit into the EE mode.
  MODE switch/connector panel → PB/EE
  Put the unit into STOP mode.
- CH-3/4 OUT switch/connector panel → LINE
- CAMERA/LINE switches (CH-1 through CH-4) / connector panel → LINE
- -60/-20/+4 dB switches (CH-1 through CH-4) /connector panel → +4 dB
- AUDIO REC LEVEL ON/OFF/PRESET switches (CH-1 through CH-4) /connector panel → PRESET
- On the setup menu, set PAGE and ITEM as follows.
  PAGE : <AUDIO>
  ITEM : INPUT 1/2 → ANA
  ITEM : INPUT 3/4 → ANA
  ITEM : EMPHASIS → OFF

Adjustment procedure

1. CH-1 INPUT Level Adjustment
   Inputs 1 kHz +4 dBu signal to the AUDIO IN CH-1 connector on the connector panel.
   Equipment : Audio level meter
   Test point : AUDIO OUT CH-1 connector
   Adjustment point : ⊘RV1 (L-3 : B) /ADA-44
   Specification : +4.0 ±0.1 dBm (600 Ω)

2. Adjust the distortion for channnel-2 through 4 in the same way.

	Test point	Adjustment point
CH-2	AUDIO OUT CH-2	⊘RV2 (L-2 : B)
CH-3	AUDIO OUT CH-3	⊘RV3 (L-2 : B)
CH-4	AUDIO OUT CH-4	⊘RV4 (L-2 : B)

3. Setting after adjustment
   Reset switches and menu to the former positions.

9-4-3. DC Offset Adjustment

Preparation

- Disconnect the cable from the AUDIO IN connectors (CH-1 through CH-4) /connector panel.

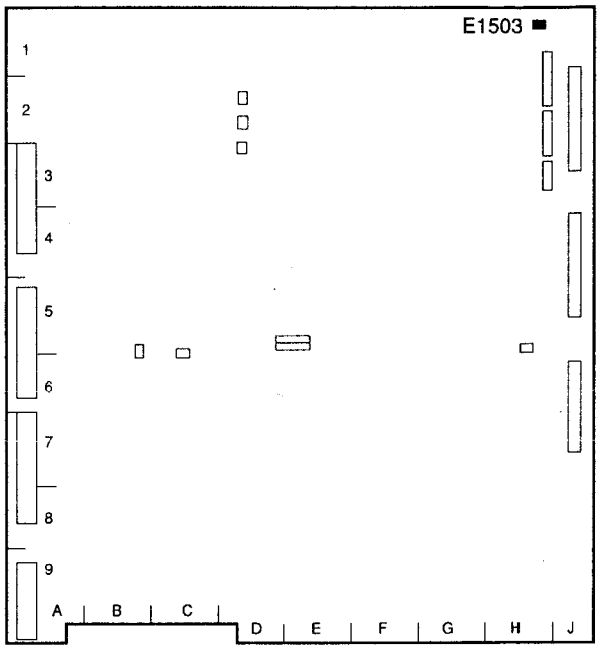
Adjustment procedure

1. CH-1 DC Offset Adjustment
   Equipment : Oscilloscope (TRIG slope :–)
   Test point : TP1002 (J-2 : B) /DPR-62
   GND : E1503 (H-1) /DPR-62
   Adjustment point : ⊘RV5 (L-3 : B) /ADA-44

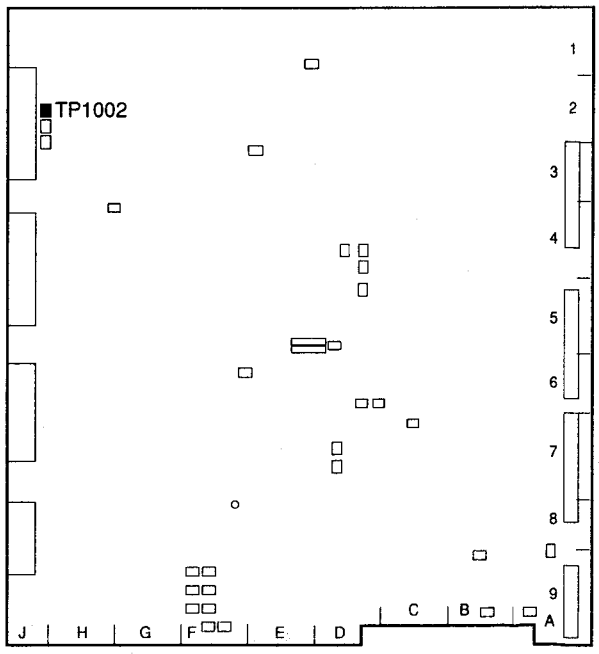
Equate the intensity of two lines.

2. Adjust the channnel-2 through 4 in the same way.

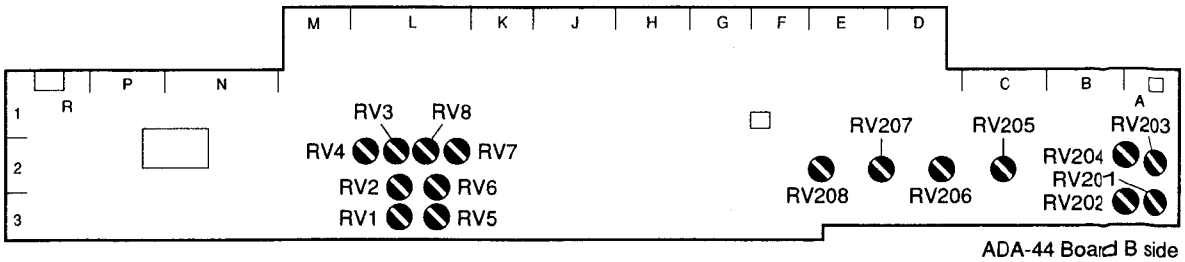
	Test point	TRIG slope	Adjustment point
CH-2	TP1002 (J-2 : B)	+	⊘RV6 (L-2 : B)
CH-3	TP1001 (J-2 : B)	–	⊘RV7 (L-2 : B)
CH-4	TP1001 (J-2 : B)	+	⊘RV8 (L-2 : B)



DPR-62 Board A side



DPR-62 Board B side



ADA-44 Board B side

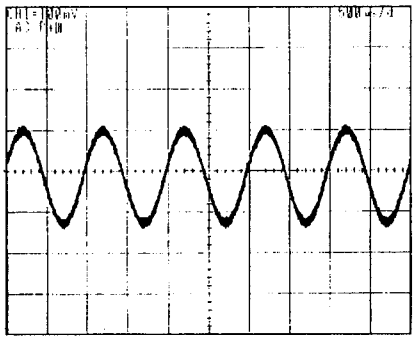
9-4-4. CUE ERASE Current Adjustment

Adjustment procedure

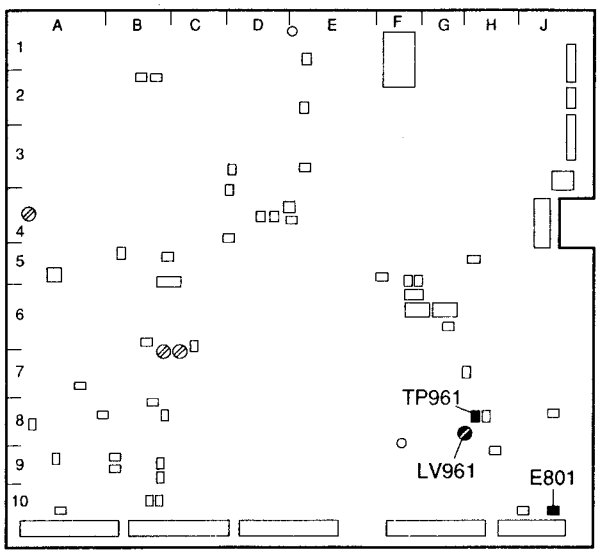
1. Insert a blank tape.

2. Press the CUE DUB button on the front panel together with the PLAY button on the front panel.
(CUE DUB mode)

3. Equipment : Oscilloscope
Test point : TP961 (H-8) /SST-3
GND : E801 (J-10) /SST-3
Adjustment point : ⊘LV961 (G-8) /SST-3
Specification : Maximum
(Reference value : 390 ±20 mV p-p)



4. Eject the tape.



SST-3 Board A side

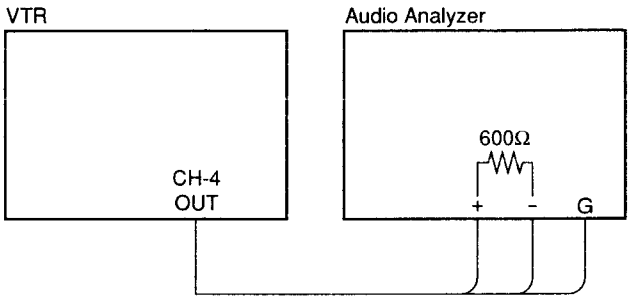
9-4-5. CUE Channel PB Frequency Characteristics Adjustment

Note

The each audio level should be corrected according to the correction value. (Refer to "9-1-4. Test Signals.")

Preparation

- CH-3/4 OUT switch/connector panel → MON
- MONITOR SELECT switch/connector panel → CUE



Adjustment procedure

1. Insert an alignment tape (ZR5-1/P) and play back a 1 kHz, 0 VU portion (TIME;00 : 00 : 00 - 01 : 24 : 29).
Equipment : Audio Analyzer
Test point : AUDIO OUT CH-4 connector on the connector panel
Adjustment point : ⊘RV803 (G-1 : B) /EQ-54
Specification : 4.0 ±0.2 dBm (600 Ω)

2. Play back a 1 kHz, -20 VU portion (TIME;01 : 30 : 00 - 02 : 24 : 29) of the alignment tape.
Equipment : Audio Analyzer
Test point : AUDIO OUT CH-4 connector on the connector panel
Measure the 1 kHz CUE level A (dBm).

3. Play back a 7 kHz, -20 VU portion (TIME;03 : 00 : 00 - 03 : 24 : 29) of the alignment tape.
Equipment : Audio Analyzer
Test point : AUDIO OUT CH-4 connector on the connector panel
Adjustment point : ⊘RV802 (G-1 : B) /EQ-54
Specification : A ±0.7 dBm (600 Ω)

4. Play back a 12 kHz, -20 VU portion (TIME;04 : 00 : 00 - 04 : 24 : 29) of the alignment tape.
   Equipment : Audio Analyzer
   Test point : AUDIO OUT CH-4 connector on the connector panel
   Adjustment point : ⊘RV801 (G-1 : B) /EQ-54
   Specification : A ±0.7 dBm (600 Ω)

5. Perform STEP 1 again.

6. Eject the tape.

7. Setting after adjustment
   Reset switches to the former positions.

9-4-6. CUE Bias Adjustment

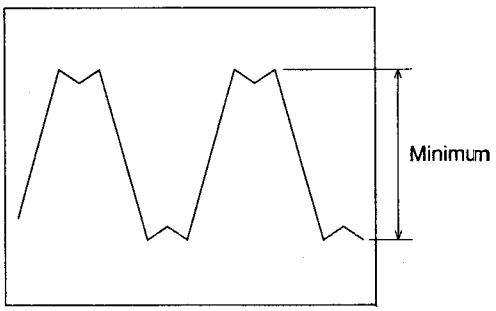
Preparation

- Disconnect the cable from the AUDIO IN CH-4 connector/connector panel.
- CUE REC switch/connector panel → ON
- Put the unit into EE mode.
  MODE switch/connector panel → PB/EE
  Put the unit into STOP mode.

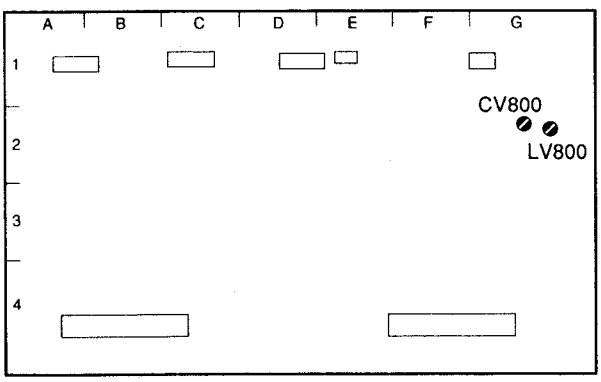
Adjustment procedure

1. Equipment : Audio noise meter
   Test point : TP804 (G-1 : B) /EQ-54
   GND : TP805 (G-1 : B) /EQ-54
   Adjustment point : ⊘CV800 (G-2) /EQ-54
   Specification : 18 ±1 mV rms

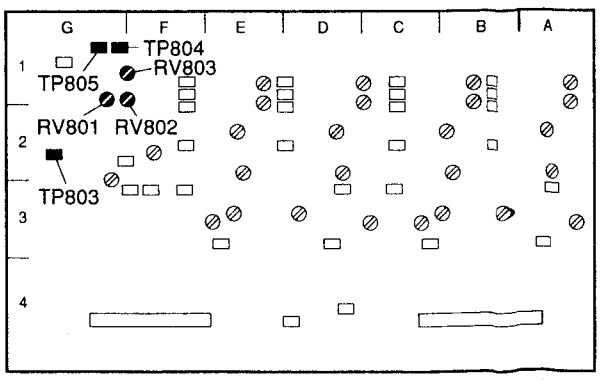
2. Equipment : Oscilloscope
   Test point : TP803 (G-2 : B) /EQ-54
   Adjustment point : ⊘LV800 (G-2) /EQ-54
   Specification : Minimum (1.8 V p-p or less)



3. Repeat steps 1 and 2 until the specifications (steps 1 and 2) are met.



EQ-54 Board A side

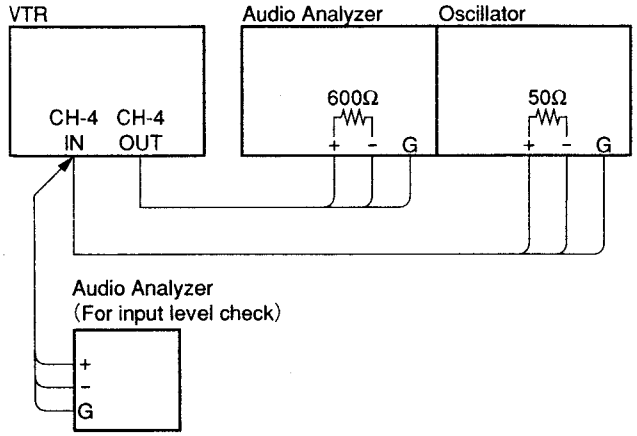


EQ-54 Board B side

9-4-7. CUE REC Level Adjustment

Preparation

- CUE REC switch/connector panel → ON
- UNI/VAR switches (CH-4) /front panel → UNI



Adjustment procedure

1. Inputs the following signal to the AUDIO IN CH-4 connector on the connector panel.
   Test point : AUDIO IN CH-4 connector on the connector panel
   Specification : 1 kHz, +16.0 ±0.1 dBu

2. Insert a blank tape, and record the signal about 10 seconds.

3. Play back the recorded portion, and check that the specification is met.
   Equipment : Audio Analyzer
   Test point : AUDIO OUT CH-4 connector on the connector panel
   Specification : +4.0 ±0.2 dBm (600 Ω)

   If the specification is not met, execute fine adjustment using ●RV800 (G-2 : B) /EQ-54 and repeat from step 2.

4. Inputs the following signal to the AUDIO IN CH-4 connector on the connector panel.
   Test point : AUDIO IN CH-4 connector on the connector panel
   Specification : 1 kHz, -4.0 ±0.1 dBu

5. Insert a blank tape, and record the signal about 10 seconds.

6. Play back the recorded portion.
   Equipment : Audio Analyzer
   Test point : AUDIO OUT CH-4 connector on the connector panel
   Measure the 1 kHz CUE level A (dBm).

7. Inputs the following signal to the AUDIO IN CH-4 connector on the connector panel.
   Test point : AUDIO IN CH-4 connector on the connector panel
   Specification : 10 kHz, -4.0 ±0.1 dBu

8. Insert a blank tape, and record the signal about 10 seconds.

9. Play back the recorded portion, and check that the specification is met.
   Equipment : Audio Analyzer
   Test point : AUDIO OUT CH-4 connector on the connector panel
   Specification : A ±2.0 dBm (600 Ω)

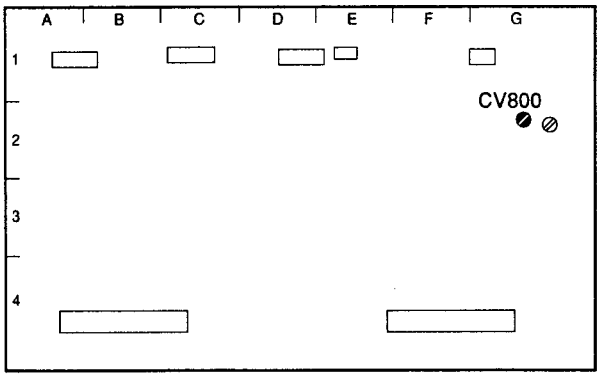
   In the measured value is out of the specification, adjust it as follows.

10. Equipment: Audio noise meter
    Test point : TP804 (G-1: B) /EQ-54
    Adjustment point : ●CV800 (G-2) /EQ-54
    Specification : 18 ±1 mV rms

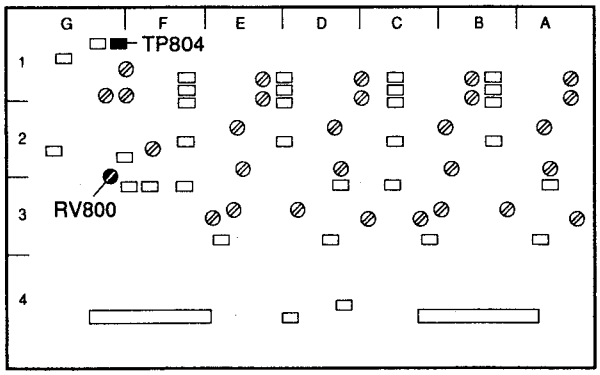
    When the measurement level is more than that defined by the specification at the step 9, increase the level within the specification at the step 10.
    When the measurement level is less than that defined by the specification at the step 9, lower the level within the specification at the step 10.

11. Eject the tape.

12. Setting after adjustment
    Reset switches to the former positions.

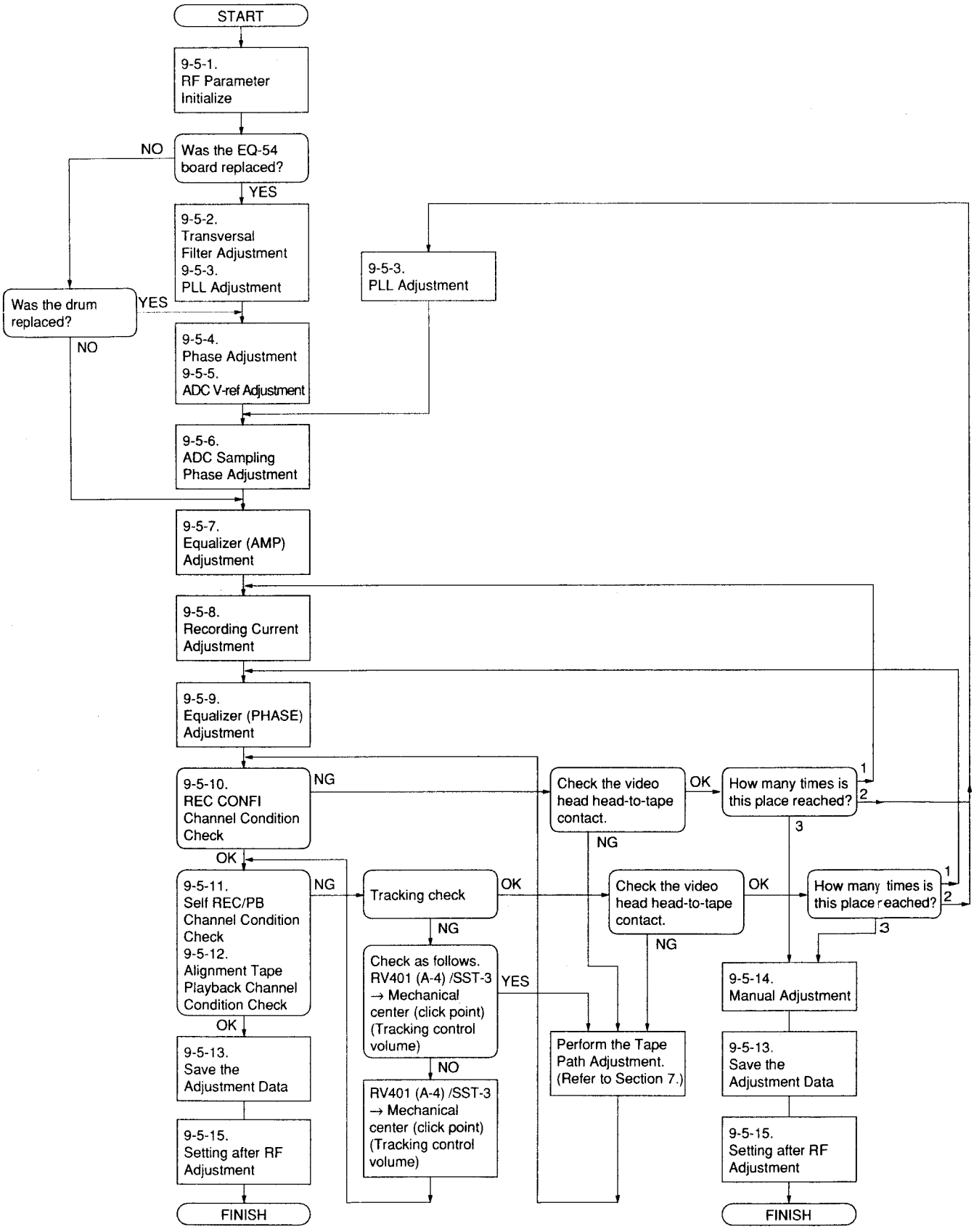


EQ-54 Board A side



EQ-54 Board B side

9-5. RF System Adjustment



Note

Before adjustment, perform the following items.

- Clean the heads.
- Set the switches S700-2, -3 (C-1) /EQ-54 to ON and turn the power on and warm up the unit for about 10 minutes.

Preparation

- S700-1 to 4 (C-1) /EQ-54 → OFF
- S151-1 (F-1) /SST-3 → ON :Into the changeable mode in DIAG menu
- ⊘RV401 (A-4) /SST-3 → Mechanical center (Click point)
- MODE switch/connector panel → PB/EE
- CONFI switch/connector panel → ON
- CAMERA/VIDEO/SDI input select switch/connector panel → VIDEO
- Inputs the black burst or color bars signal to the VIDEO IN connector on the connector panel.

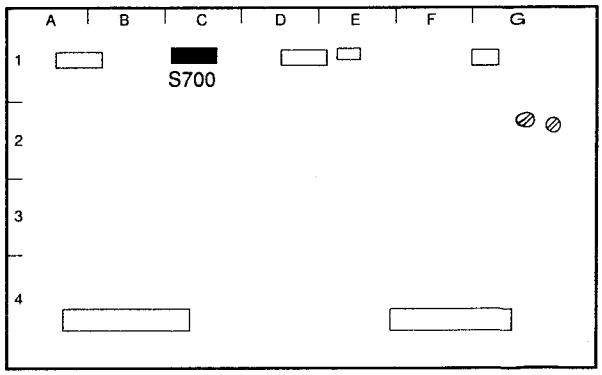
When RF adjustment is completed, save the adjustment data certainly. (Refer to Section 9-5-13.)
If the adjustment is finished without saving data, data is returned to the former condition.

Notice in RF adjustment

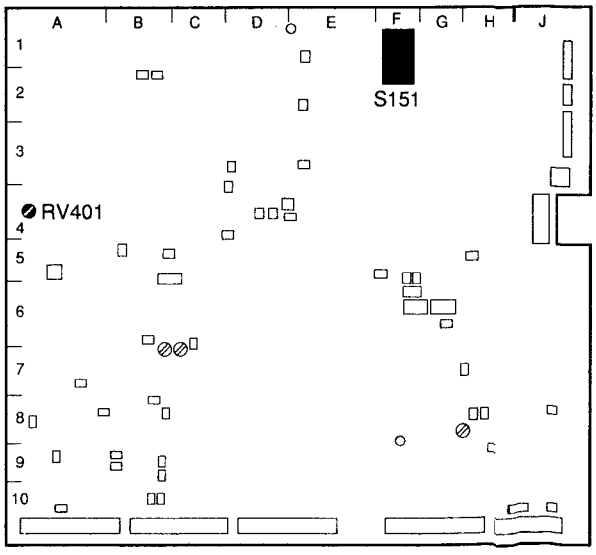
Care of video cassette tape

- Do not use same portion of an alignment tape (ZR5-1/P) about 50 times or more.
- Do not use same portion of a blank tape about 10 times or more.
- Do not use within about two minutes of the end of a blank tape.
- If scratch is observed to the tape, exchange the tape immediately, and check the servo system adjustment and tape running adjustment of the unit which causes the tape scratch.
- If the contents of an alignment tape is erased by the trouble of the unit, exchange the tape immediately, and check and repair the unit (especially check the connection between CN913 (D-3) on the MB-601 board and CN1 on the DR-239 board on the drum assembly.

In case of "ABORT" is displayed during the automatic adjustment;
If the unit detects the servo unlock or tape near-end during the automatic adjustment, The "ABORT" is displayed and stop the unit.
In this case, remedy the ploblem and adjust again.



EQ-54 Board A side



SST-3 Board A side

9-5-1. RF Parameter Initialize

1. S151-6 (F-1) /SST-3 → ON
2. Turn the power off and turn the power on again. (Initialize-1)
3. S151-6 (F-1) /SST-3 → OFF
4. Turn the power off and turn the power on again. (Initialize-2)
5. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><A/Ech>
6. Check that the RF parameters set as follows. (Check the initialized data)

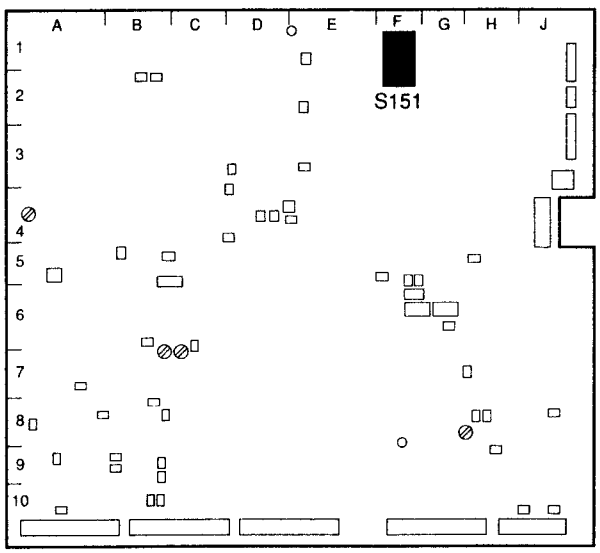
	AMP	PHS	REC
Ach:	38	40	28
Ech:	38	40	28

(for NTSC)

	AMP	PHS	REC
Ach:	40	40	28
Ech:	40	40	28

(for PAL)

7. Check the B/F, C/G, D/H channels in the same way.
8. Out of the DIAG menu.



SST-3 Board A side

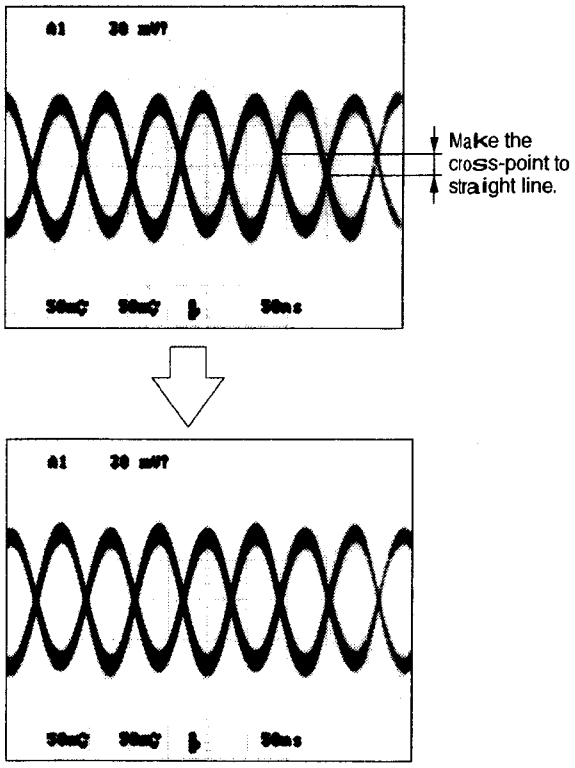
9-5-2. Transversal Filter Adjustment

Preparation

- S700-4 (C-1) /EQ-54 → ON

Adjustment procedure

1. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><TTP><PATH>
   ITEM : TEST SG → C2 (8 MHz test signal)
2. Insert a blank tape and put the unit into the REC mode. (record an internal 8 MHz test signal.)
3. Oscilloscope settings
   - AC mode
   - CH-1:50 mV/DIV
   - CH-2:50 mV/DIV
   - TIME:50 ns/DIV
   - 20 MHz BW Limit:ON
   - Set the GND levels of CH-1 and CH-2 are at the center of the oscilloscope.
4. Test point : TP100 (B-1:B) /EQ-54
   TP102 (B-2:B) /EQ-54
   Adjustment point : ⊘RV101 (A-1:B) /EQ-54
   Specification : Make the cross-point to straight line.



5. Adjust the B/F, C/G, D/H channels in the same way.

	Test point	Adjustment point
B/Fch	TP200 (C-1:B) TP202 (C-2:B)	⊘RV201 (B-1:B)
C/Gch	TP300 (D-1:B) TP302 (D-2:B)	⊘RV301 (D-1:B)
D/Hch	TP400 (F-1:B) TP402 (F-2:B)	⊘RV401 (E-1:B)

6. Eject the tape.

7. S700-4 (C-1) /EQ-54 → OFF

Setting after adjustment

Reset menu to the former positions.

PAGE : <TEST><TTP><PATH>

ITEM : TEST SG → OFF

9-5-3. PLL Adjustment

Preparation

- Disconnect the harness from CN301 (A-1) and CN303 (D-1) connectors on the EQ-54 board.

Adjustment procedure

1. Insert a blank tape and put the unit into the REC mode.

2. A/Ech Adjustment

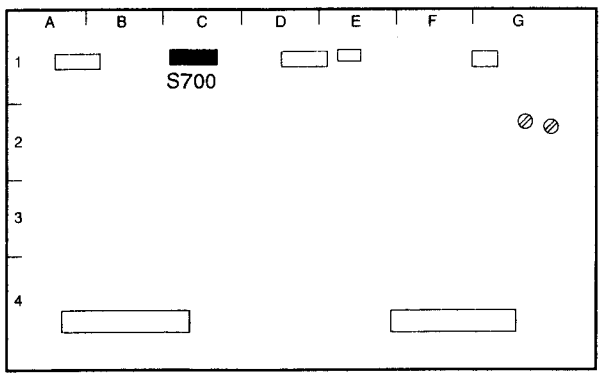
   Equipment : Frequency counter
   Test point : TP105 (A-3:B) /EQ-54
   Adjustment point : ⊘RV103 (B-3:B) /EQ-54
   Specification : 33.08 ±0.02 MHz (for NTSC)
   Specification : 32.51 ±0.02 MHz (for PAL)

3. Adjust the B/F, C/G, D/H channels in the same way.

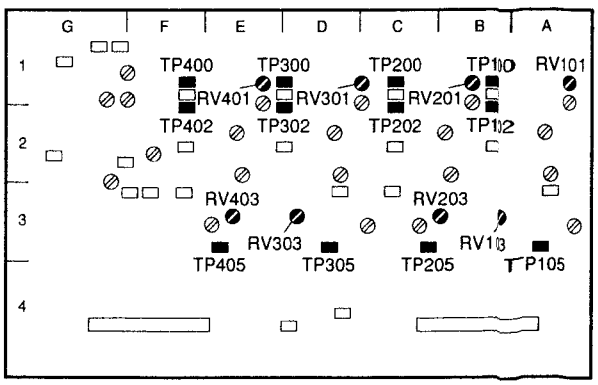
	Test point	Adjustment point
B/Fch	TP205 (C-3:B)	⊘RV203 (B-3:B)
C/Gch	TP305 (D-3:B)	⊘RV303 (D-3:B)
D/Hch	TP405 (E-3:B)	⊘RV403 (E-3:B)

4. Eject the tape.

5. Connect the harness to CN301 (A-1) and CN303 (D-1) connectors on the EQ-54 board.



EQ-54 Board A side



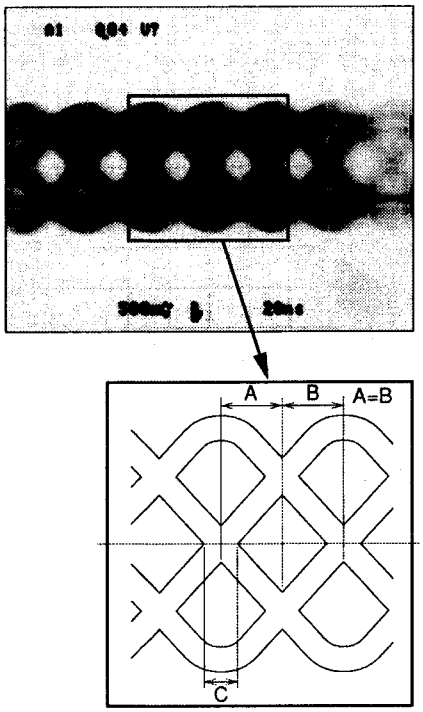
EQ-54 Board B side

9-5-4. Phase Adjustment

Adjustment procedure

1. Insert an alignment tape (ZR5-1/P) and put the unit into the PB mode.

2. A/Ech Adjustment
   Equipment : Oscilloscope
   (20 MHz BW Limit : ON)
   Test point : TP104 (A-3:B) /EQ-54
   TRIG : TP105 (A-3:B) /EQ-54
   Adjustment point : ⊘RV100 (A-2:B) /EQ-54
   Specification : A = B and minimize the portion C.



3. Adjust the B/F, C/G, D/H channels in the same way.

	Test point	TRIG	Adjustment point
B/Fch	TP204 (C-3:B)	TP205 (C-3:B)	⊘RV200 (B-2:B)
C/Gch	TP304 (D-3:B)	TP305 (D-3:B)	⊘RV300 (D-2:B)
D/Hch	TP404 (F-3:B)	TP405 (E-3:B)	⊘RV400 (E-2:B)

4. Eject the tape.

9-5-5. ADC V-ref Adjustment

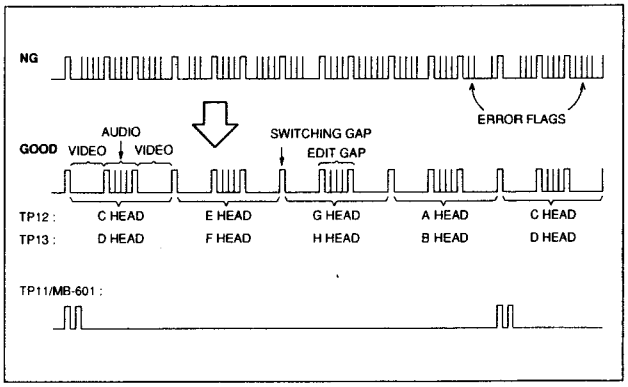
Adjustment procedure

1. Insert an alignment tape (ZR5-1/P) and put the unit into the PB mode.

2. Turn ⊘CV100 (A-2:B) /EQ-54 a little and increase the error flags of A/Ech.
   Check point : TP12 (C-3) /MB-601

3. Turn ⊘CV200 (B-2:B) , ⊘CV300 (D-2:B) and ⊘CV400 (E-2:B) in the same way.

4. A/Ech Adjustment
   Equipment : Oscilloscope
   Test point : TP12 (C-3) /MB-601 (A/C/E/Gch)
   TP13 (C-3) /MB-601 (B/D/F/Hch)
   TRIG : TP11 (D-3) /MB-601
   Adjustment point : ⊘RV104 (A-3:B) /EQ-54
   Specification : Minimize the error flags.


NG
ERROR FLAGS
AUDIO
GOOD VIDEO VIDEO
SWITCHING GAP
EDIT GAP
TP12 : C HEAD E HEAD G HEAD A HEAD C HEAD
TP13 : D HEAD F HEAD H HEAD B HEAD D HEAD
TP11/MB-601 :

5. Adjust the B/F, C/G, D/H channels in the same way.

	Adjustment point
B/Fch	⊘RV204 (C-3:B)
C/Gch	⊘RV304 (C-3:B)
D/Hch	⊘RV404 (E-3:B)

6. Eject the tape.

9-5-6. ADC Sampling Phase Adjustment

Note

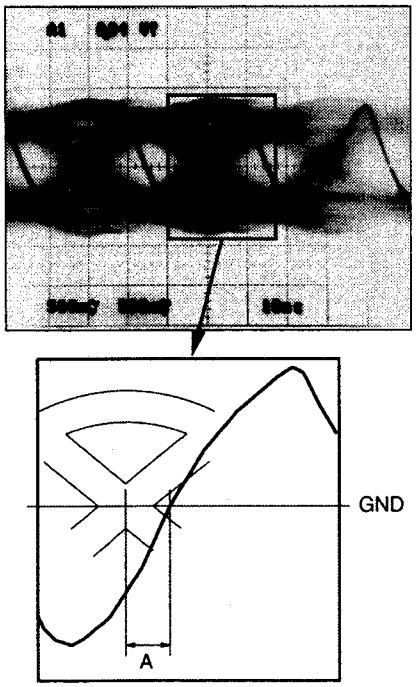
Use the identical probes of the oscilloscope.

Adjustment procedure

1. Insert an alignment tape (ZR5-1/P) and put the unit into the PB mode.

2. Oscilloscope settings
   - AC mode
   - 20 MHz BW Limit:OFF
   - Set the GND levels of CH-1 and CH-2 are at the center of the oscilloscope.

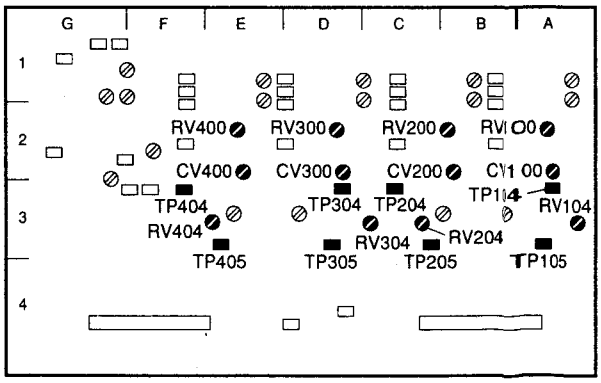
3. A/Ech Adjustment
   Test point : TP104 (A-3:B) /EQ-54
   TRIG : TP105 (A-3:B) /EQ-54
   Adjustment point : ⊘CV100 (A-2:B) /EQ-54
   Specification : A = 0 ±2 ns



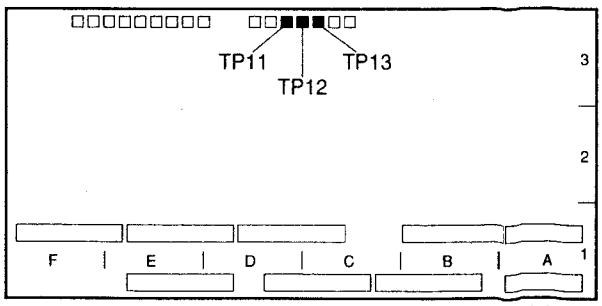
4. Adjust the B/F, C/G, D/H channels in the same way.

	Test point	TRIG	Adjustment point
B/Fch	TP204 (C-3:B)	TP205 (C-3:B)	⊘CV200 (B-2:B)
C/Gch	TP304 (D-3:B)	TP305 (D-3:B)	⊘CV300 (D-2:B)
D/Hch	TP404 (F-3:B)	TP405 (E-3:B)	⊘CV400 (E-2:B)

5. Eject the tape.



EQ-54 Board B side



MB-601 Board A side

9-5-7. Equalizer (AMP) Adjustment

Adjustment procedure

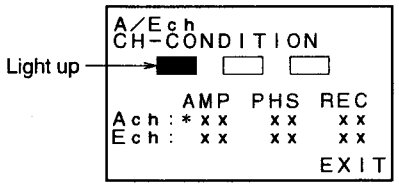
1. Insert an alignment tape (ZR5-1/P) and put the unit into the PB mode.

2. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><AUTO ADJUST>
   ITEM : AMP ADJ → ON

3. Push the SET button on the front panel, then executed the automatic adjustment mode.

4. When the automatic adjustment is completed, the following message is indicated.
   AMP ADJ → OFF

5. On the DIAG menu, set PAGE as follows.
   PAGE : <TEST><RF><A/Ech>
   Check the channel condition of A/Ech.
   Specification : Only leftmost square on the LCD lights up.



   Perform the manual adjustment of A/Ech AMP data when the specification is not met.
   (Refer to "9-5-14. Manual Adjustment.")

6. Check the B/F, C/G, D/H channels in the same way.

7. Eject the tape.

9-5-8. Recording Current Adjustment

Adjustment procedure

1. Insert a blank tape and put the unit into the REC mode.

2. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><AUTO ADJUST>
   ITEM : REC ADJ → ON

3. Push the SET button on the front panel, then executed the automatic adjustment mode.

4. When the automatic adjustment is completed, the following message is indicated.
   REC ADJ → OFF

5. Eject the tape.

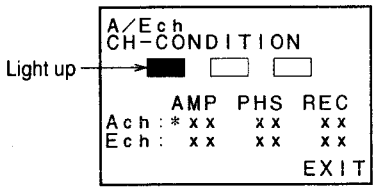
9-5-9. Equalizer (PHASE) Adjustment

Adjustment procedure

1. Insert a blank tape and put the unit into the REC mode.
2. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><AUTO ADJUST>
   ITEM : PHS ADJ → ON
3. Push the SET button on the front panel, then executed the automatic adjustment mode.
4. When the automatic adjustment is completed, the following message is indicated.
   PHS ADJ → OFF
5. Eject the tape.

9-5-10. REC CONFI Channel Condition Check

1. Insert a blank tape and put the unit into the REC mode.
2. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><A/Ech>
   Check the channel condition of A/Ech.
   Specification : Only leftmost square on the LCD lights up.



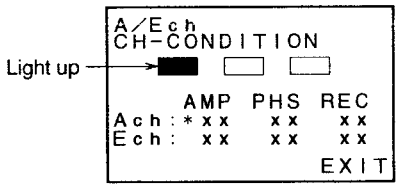
3. Check the B/F, C/G, D/H channels in the same way.

9-5-11. Self REC/PB Channel Condition Check

1. Insert a blank tape and record the signal about one minute.

2. Play back the recorded portion.

3. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><A/Ech>
   Check the channel condition of A/Ech.
   Specification : Only leftmost square on the LCD lights up.

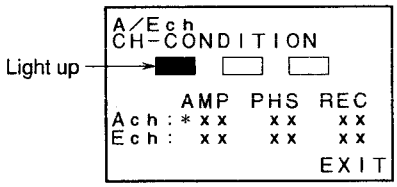


4. Check the B/F, C/G, D/H channels in the same way.

9-5-12. Alignment Tape Playback Channel Condition Check

1. Insert an alignment tape (ZR5-1/P) and put the unit into the PB mode.

2. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><A/Ech>
   Check the channel condition of A/Ech.
   Specification : Only leftmost square on the LCD lights up.



3. Check the B/F, C/G, D/H channels in the same way.

9-5-13. Save the Adjustment Data

1. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><RF><NV-RAM>
   ITEM : SAVE

2. Press the SET button.

9-5-14. Manual Adjustment

Perform the following manual settings of parameters when the specifications are not met in the Channel Condition Check (Sections 9-5-10 to 9-5-12).
Before this adjustment, Save the adjustment data (Refer to Section 9-5-13).

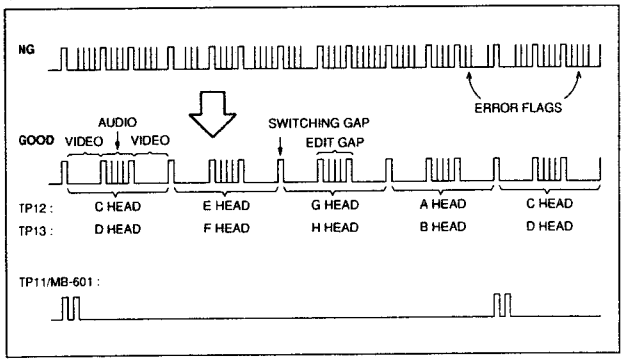
Method of parameter changing
(Change the parameter to minimize the error flags.)

1. On the DIAG menu, open the PAGE of the channel concerned.
   Example)
   PAGE : <TEST><RF><A/Ech>

2. Select the item using the UP/DOWN button, and push the SET button.

3. Change the data using the UP/DOWN button, and push the SET button.

Perform the following adjustment when section "9-5-10. REC CONFI Channel Condition Check" is not completed. (Check the error flags during this step.)


NG
ERROR FLAGS
AUDIO
GOOD VIDEO VIDEO
SWITCHING GAP
EDIT GAP
TP12 : C HEAD E HEAD G HEAD A HEAD C HEAD
TP13 : D HEAD F HEAD H HEAD B HEAD D HEAD
TP11/MB-601 :

1. Change the REC data of the nonconforming channels.

2. Check the REC CONFI channel condition of the nonconforming channels. (Refer to Section 9-5-10.)

3. Repeat the steps 1 and 2 until the following specification is met.
   Specification : Only leftmost square on the LCD lights up.

4. If not, adjust as follows.

5. Change the PHASE data of the nonconforming channels.

6. Check the channel conditions (REC CONFI, Self REC/PB, Alignment Tape Playback) of the nonconforming channels. (Refer to Sections 9-5-10 to 9-5-12.)

7. Repeat the steps 5 and 6 until the following specification is met.
   Specification:Only leftmost square on the LCD lights up.

Perform the following adjustment when section "9-5-11. Self REC/PB Channel Condition Check" and/or section "9-5-12. Alignment Tape Playback Channel Condition Check" is not completed. (Check the error flags during this step.)

1. Change the PHASE data of the nonconforming channels.

2. Check the channel conditions (REC CONFI, Alignment Tape Playback) of the nonconforming channels. (Refer to Sections 9-5-10 and 9-5-12.)

3. Repeat the steps 1 and 2 until the following specification is met.
   Specification : Only leftmost square on the LCD lights up.

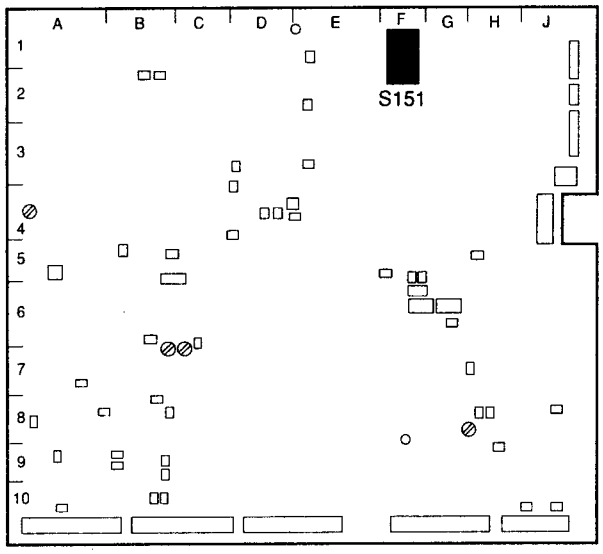
4. Check the Self REC/PB channel condition of the nonconforming channels. (Refer to Sections 9-5-11.)

   After adjustment is completed, save the adjustment data .(Refer to Section 9-5-13.)

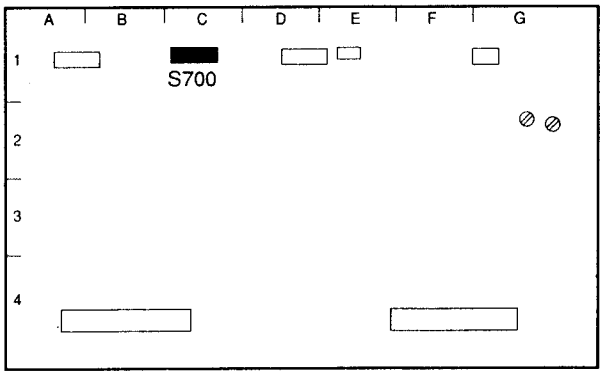
9-5-15. Setting after RF Adjustment

Set the following switches.
- S151-1 (F-1) /SST-3 → OFF
- CONFI switch/connector panel → OFF

Check the following switches
- S151-6 (F-1) /SST-3 → OFF
- S700-1 to 4 (C-1) /EQ-54 → OFF



SST-3 Board A side



EQ-54 Board A side

9-6. Video System Adjustment-1

9-6-1. Frequency Adjustment

Preparation

- CAMERA/VIDEO/SDI input select switch/connector panel → SDI
- MODE switch/connector panel → PB/EE
- On the setup menu, set PAGE and ITEM as follows.
  PAGE : <VIDEO 2>
  ITEM : SDI OUT → ON
- S300-1 (C-4 : B) /DIF-31 → ON
  S300-2 (C-4 : B) /DIF-31 → ON

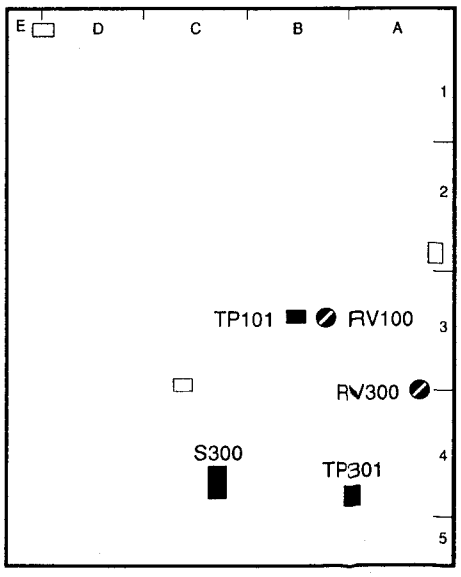
Before adjustment, wait 10 minutes or more after the above steps are completed.

Adjustment procedure

1. Equipment : Frequency counter
   Test point : TP101 (B-3 : B) /DIF-31
   Adjustment point : ⊘RV100 (B-3 : B) /DIF-31
   Specification : 27.0 ±0.1 MHz

2. Equipment : Frequency counter
   Test point : TP301 (A-4 : B) /DIF-31
   Adjustment point : ⊘RV300 (A-3 : B) /DIF-31
   Specification : 27.0 ±0.1 MHz

3. Setting after adjustment
   Reset switches and menu to the former positions.



DIF-31 Board B side

9-7. Video System Adjustment-2

Preparation

- Put the unit into EE mode.
  MODE switch/connector panel → PB/EE
  Put the unit into STOP mode.
- CONFI switch/connector panel → OFF
- On the setup menu, set PAGE and ITEM as follows. (for NTSC only)
  PAGE : <VIDEO 1> <SET UP LEVEL>
  ITEM : MASTER LEVEL → 7.5%
  ITEM : INPUT LEVEL → MASTER
  ITEM : V BLK REMOTE CNT → OFF
  ITEM : OUTPUT LEVEL → MASTER
- On the setup menu, set PAGE and ITEM as follows.
  PAGE : <VIDEO 2>
  ITEM : VIDEO LEVEL → 0.0%

  PAGE : <VIDEO 2>
  ITEM : SDI OUT → ON

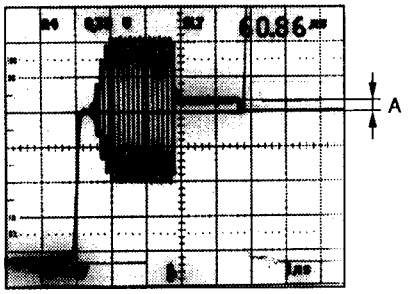
9-7-1. Pedestal Level Adjustment

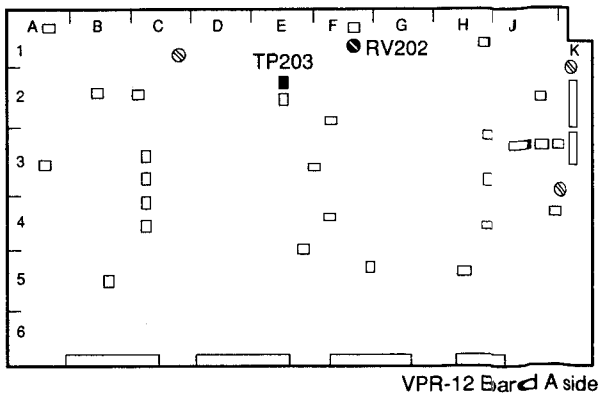
Preparation

- Put the unit into EE mode.
- CAMERA/VIDEO/SDI input select switch/connector panel → VIDEO
- VIDEO LEVEL knob/connector panel → Mechanical center (Click position)
- Inputs the composite video signal to the VIDEO IN connector on the connector panel.
  Signal generator : 75 % Color bars

Adjustment procedure

1. Equipment : Oscilloscope
   Test point : TP203 (E-2)/VPR-12
   Adjustment point : ⊘RV202 (F-1)/VPR-12
   Specification : 0 ±5 mV





VPR-12 Board A side

9-7-2. Composite Input Level Adjustment

Preparation

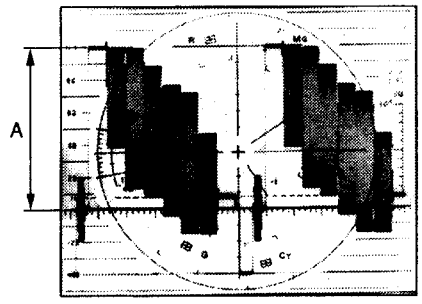
- Put the unit into EE mode.
- CAMERA/VIDEO/SDI input select switch/connector panel → VIDEO
- VIDEO LEVEL knob/connector panel → Mechanical center (Click position)
- Inputs the composite video signal to the VIDEO IN connector on the connector panel.
  Signal generator : 75 % Color bars

Adjustment procedure

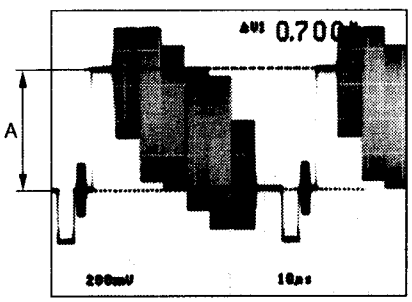
1. Equipment : Waveform monitor
   Test point : VIDEO OUT 1 connector on the connector panel
   Adjustment point : DIAG menu

2. On the DIAG menu, set PAGE and ITEM as follows.
   PAGE : <TEST><PROC 2><VPR VR3>
   ITEM : VIDEO IN

3. Adjust the level B to meet the following specification by pressing the UP and/or DOWN button on the front panel.
   A = 714 ±7 mV p-p (for NTSC)
   A = 700 ±7 mV p-p (for PAL)



[For NTSC]



[For PAL]

4. Save the adjustment data by pressing the SET button on the front panel.

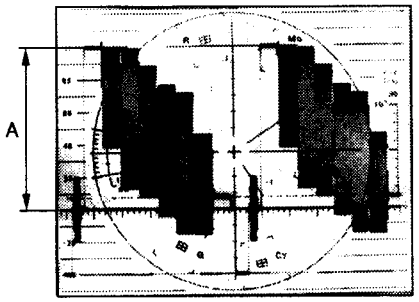
9-7-3. CAMERA RETURN VIDEO Level Adjustment

Preparation

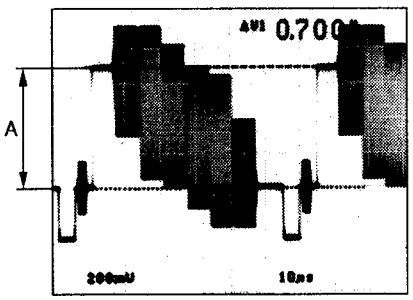
- Put the unit into EE mode.
  MODE switch/connector panel → SAVE
  Push the REC button on the front panel.
- CAMERA/VIDEO/SDI input select switch/connector panel → VIDEO
- Inputs the composite video signal to the VIDEO IN connector on the connector panel.
  Signal generator : 75 % Color bars

Adjustment procedure

1. Equipment : Waveform monitor
   Test point : VIDEO OUT 1 connector on the connector panel
   Adjustment point : ⊘RV200 (K-1) /VPR-12
   Specification : A = 714 ±7 mV p-p (for NTSC)
   A = 700 ±7 mV p-p (for PAL)



[For NTSC]



[For PAL]

2. Setting after adjustment
   Reset switches to the former positions.
   (MODE switch/connector panel → PB/EE)

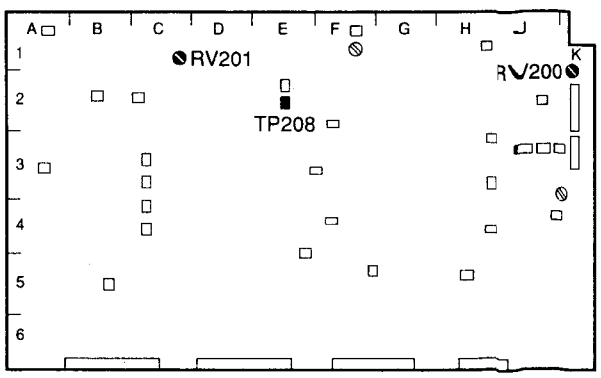
9-7-4. INPUT SYNC Level Adjustment

Preparation

- Put the unit into EE mode.
- CAMERA/VIDEO/SDI input select switch/connector panel → VIDEO
- Inputs the composite video signal to the VIDEO IN connector on the connector panel.
  Signal generator : 75 % Color bars

Adjustment procedure

Equipment : Oscilloscope
(20 MHz BW Limit : ON)
Test point : TP208 (E-2) /VPR-12
Adjustment point : ⊘RV201 (C-1) /VPR-12
Specification : A = 3.00 ±0.05 V dc



VPR-12 Board A side

Section 10
Spare Parts

10-1. Notes on Spare Parts

1. Safety Related Components Warning

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

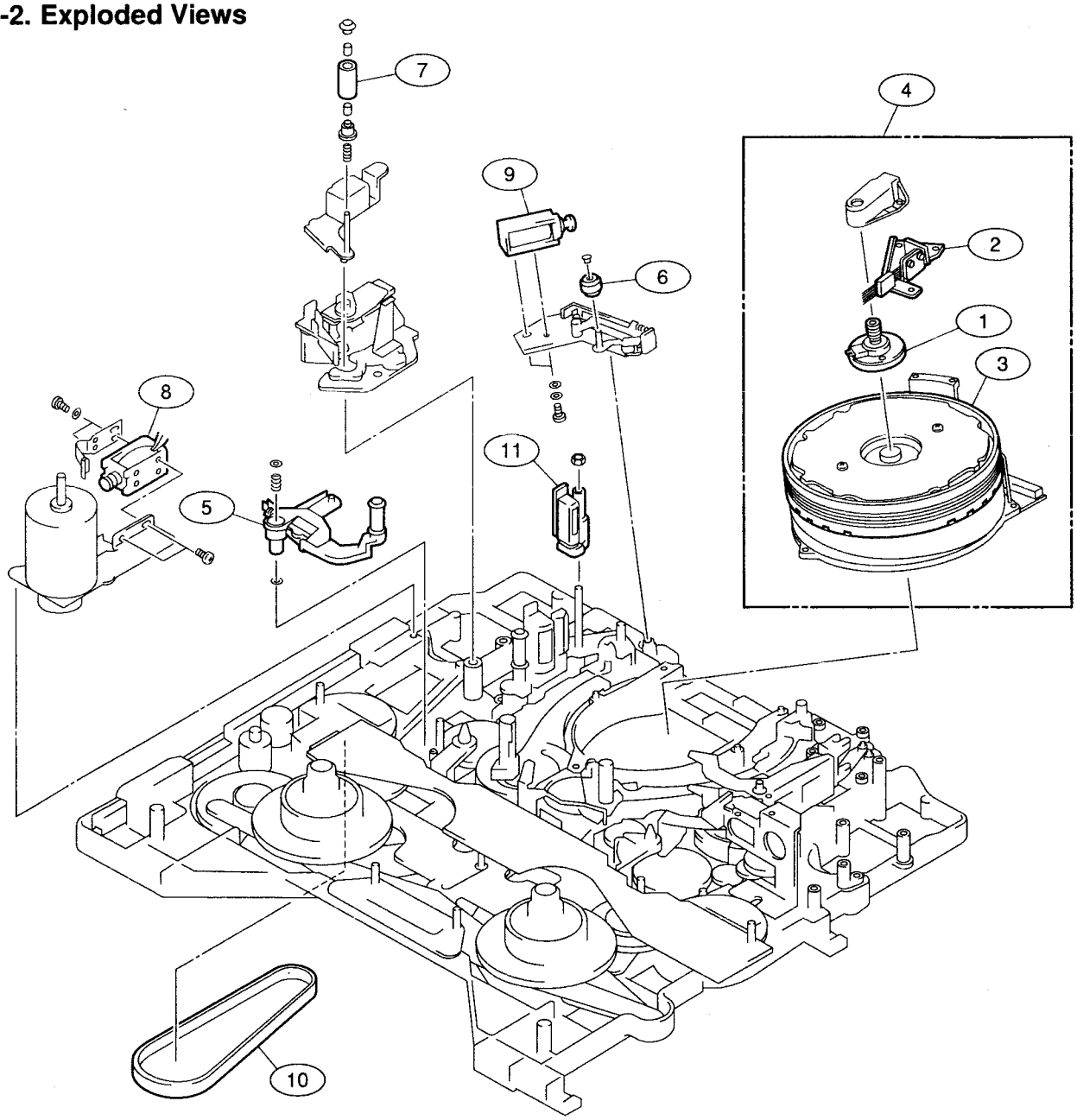
2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized spare parts.

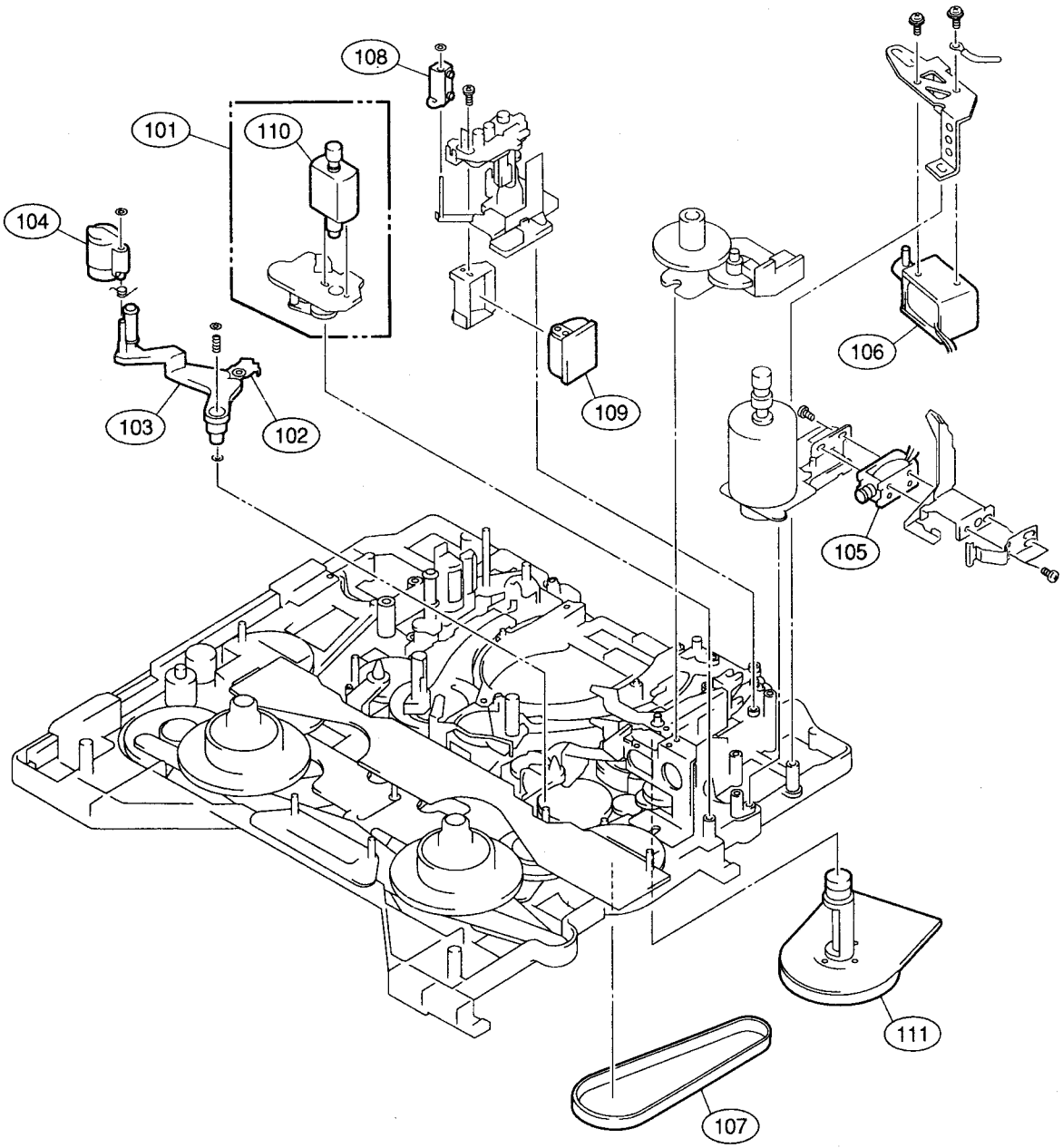
3. Stock of Parts

Parts marked with "o" at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

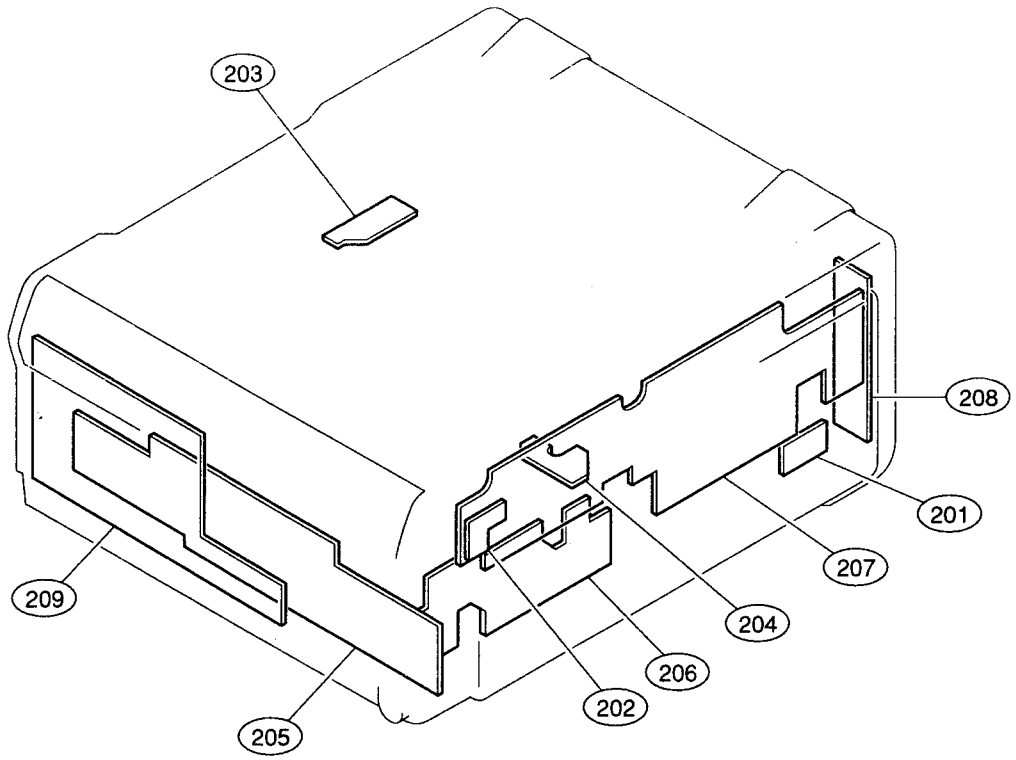
10-2. Exploded Views



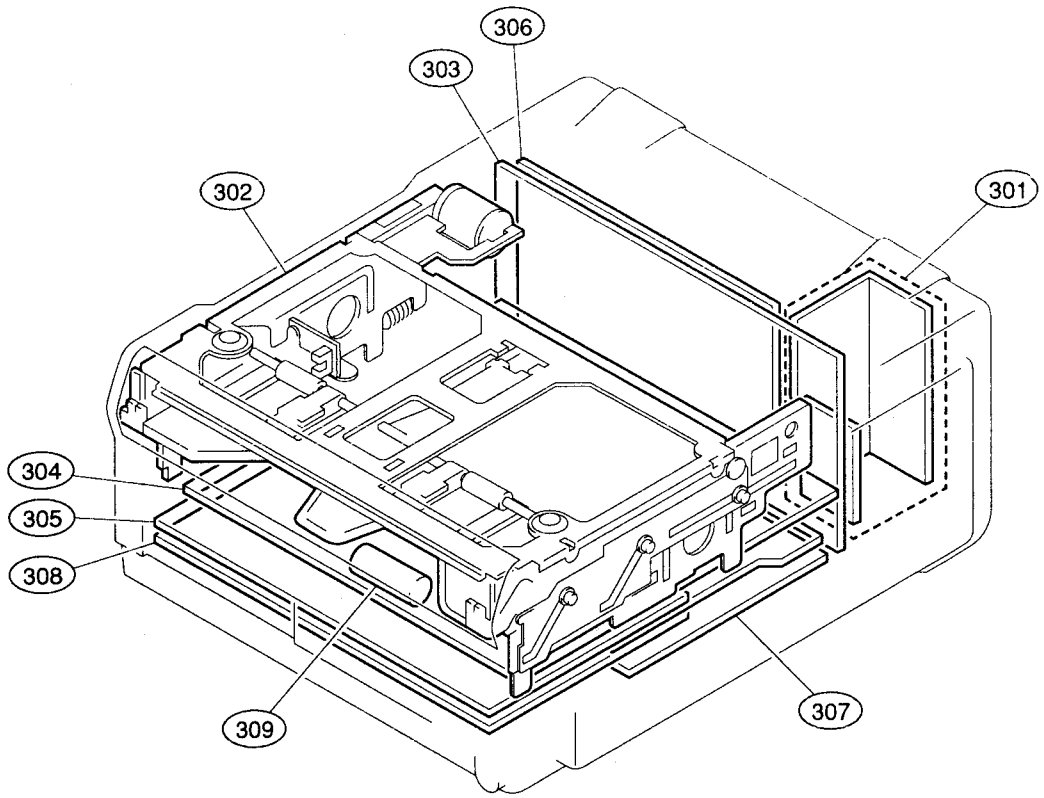
No.	Part No.	SP	Description
1	A-8263-855-A	s	RING ASSY, SLIP (RP)
2	A-8263-856-A	s	BRUSH ASSY (RP)
3	A-8269-261-A	s	UPPER DRUM, DJR-12-R [for PAL]
	A-8269-263-A	s	UPPER DRUM, DJR-11-R [for NTSC]
4	A-8269-264-A	s	DRUM, DJH-12A-R [for PAL]
	A-8269-262-A	s	DRUM, DJH-11A-R [for NTSC]
5	A-8269-452-A	o	ARM ASSY, S
6	X-3167-281-2	s	ROLLER ASSY, V CLEANING
7	X-3678-389-1	s	S-TEN ROLLER ASSY
8	1-454-334-61	s	SOLENOID, PLUNGER
9	1-454-607-21	s	SOLENOID, PLUNGER
10	3-172-003-01	s	BELT, DRIVING
11	8-825-779-71	s	CTL HEAD (PS244-21D)



No.	Part No.	SP	Description
101	A-8269-450-A	o	BLOCK ASSY, GEAR
102	X-3678-423-1	o	LINK ASSY, T
103	X-3678-424-1	o	SUB ASSY, T ARM
104	X-3678-425-3	s	ARM ASSY, PINCH ROLLER
105	1-454-334-61	s	SOLENOID, PLUNGER
106	1-454-383-31	s	SOLENOID, PLUNGER
107	3-172-003-01	s	BELT, DRIVING
108	3-681-778-01	s	BRUSH, CUE
109	8-825-920-01	s	HEAD, AUDIO EPS244-2103J
110	8-835-440-01	s	MOTOR DN20-Q7Z1B
111	8-835-534-01	s	MOTOR, DC SCV-0702A/J-N



No.	Part No.	SP	Description
201	A-6754-268-A	o	MOUNTED CIRCUIT BOARD, CON-18
202	A-6754-269-A	o	MOUNTED CIRCUIT BOARD, DUS-339
203	A-6754-272-A	o	MOUNTED CIRCUIT BOARD, TR-57
204	A-8276-926-A	o	MOUNTED CIRCUIT BOARD, DET-26
205	A-8276-930-A	o	MOUNTED CIRCUIT BOARD, ADA-44
206	A-8276-932-A	o	MOUNTED CIRCUIT BOARD, CC-66
207	A-8276-934-A	o	MOUNTED CIRCUIT BOARD, CP-260 [for UC,SY]
	A-8276-936-A	o	MOUNTED CIRCUIT BOARD, CP-260J [for J]
208	A-8276-938-A	o	MOUNTED CIRCUIT BOARD, FU-63
209	A-8276-948-A	o	MOUNTED CIRCUIT BOARD, KY-315 [for NTSC]
	A-8276-950-A	o	MOUNTED CIRCUIT BOARD, KY-315P [for PAL]



No.	Part No.	SP	Description
301	A-8269-442-A	s	POWER ASSY [for J]
	A-8269-463-A	s	POWER ASSY [for UC,SY]
302	A-8269-732-A	s	CASSETTE COMPARTMENT ASSY
303	A-8276-909-A	o	MOUNTED CIRCUIT BOARD, MB-601
304	A-8276-910-A	o	MOUNTED CIRCUIT BOARD, SST-3 [for NTSC]
	A-8276-912-A	o	MOUNTED CIRCUIT BOARD, SST-3P [for PAL]
305	A-8276-914-A	o	MOUNTED CIRCUIT BOARD, VPR-12 [for NTSC]
	A-8276-942-A	o	MOUNTED CIRCUIT BOARD, VPR-12P [for PAL]
306	A-8276-922-A	o	MOUNTED CIRCUIT BOARD, EQ-54
307	A-8276-928-A	o	MOUNTED CIRCUIT BOARD, DIF-31
308	A-8276-944-A	o	MOUNTED CIRCUIT BOARD, DPR-62 [for NTSC]
	A-8276-946-A	o	MOUNTED CIRCUIT BOARD, DPR-62P [for PAL]
309	1-528-292-11	s	BATTERY, SUPER LITHIUM ER6CN4